# ELECTRICAL SOUTH

JULY
1945

UNIVERSITY OF FLORIDA
Library

## FANS by HUNTER-CENTURY

## 58th SEASON

52-In Hotel Type

24-In "Airspred Ceiling

HUNTER, who has made fans and ventilators exclusively during 58 years, is now operating under War Production Board restrictions. • No more fans will be made except for the Army, Navy and Maritime Commission. HUNTER unfilled orders now on hand represent contracts with Government Agencies. • Certain sizes of belted exhaust types can be made available for Government hospitals and other war industries, subject to limited material inventories now on hand.

## HUNTER FAN & VENTILATING COMPANY, INC.

*Factory*: FULTON, N. Y.

*General Sales Offices*: Memphis, Sterick Bldg. *Eastern Sales Office*: New York, 92 Warren Street *Western Sales Office*: St. Louis, 1706 Olive Street

*Sales Offices*:
ATLANTA
CHICAGO
DALLAS
HOUSTON
LOS ANGELES
PHILADELPHIA

Zephair Comfort Cooling and Commercial Ventilators

*Sales Offices*:
BOSTON
CLEVELAND
DETROIT
KANSAS CITY
NEW ORLEANS
PITTSBURGH

# Pre-viewing the New WESTINGHOUSE

# HOME FREEZER

with

## "Reach-in Convenience"

**SIZES FOR BOTH CITY AND FARM**

Westinghouse will build Home Freezers in sizes for city and farm. All models will be upright with front-opening doors and sectional inner doors.

- ✓ Now it can be shown. And the big news is that the new Westinghouse is an *upright* Home Freezer.
- ✓ "Reach-in Convenience" makes all frozen foods readily accessible with the many advantages of orderly storage arrangements.
- ✓ Individual inner doors enable the homemaker to select foods from any section without disturbing foods or temperatures in other sections.
- ✓ The Westinghouse Home Freezer can be located wherever it is most convenient, because it requires no more floor space than a comparable size refrigerator.
- ✓ Exhaustive tests of the Westinghouse Home Freezer, in the laboratory and in actual homes, have established remarkable records in efficiency and economy.
- ✓ Use of the Westinghouse hermetically-sealed refrigeration *system* assures years of trouble-free operation.

***ASK YOUR WESTINGHOUSE DISTRIBUTOR ABOUT THE FULL LINE FRANCHISE***

This new *upright* Home Freezer with "Reach-in Convenience" is just one more reason why the Westinghouse Full Line Franchise will be "hot". A few territories are still open. Check your Westinghouse Appliance Distributor.

**30 MILLION PRE-WAR**

# Westinghouse

**ELECTRIC HOME APPLIANCES**

**YOUR PROMISE OF STILL FINER ONES TO COME**

WESTINGHOUSE ELECTRIC CORPORATION • *Plants in 25 Cities . . . Offices Everywhere* • APPLIANCE DIVISION • MANSFIELD, OHIO

*Tune in John Charles Thomas, Sunday 2:30 EWT., N.B.C. • Hear Ted Malone, Monday through Friday, 11:45 A. M. EWT., Blue Network*



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Volume 25 Number 7

# 97% reported company age and reputation most important buying factor!

A number of commercial tape agents were recently asked to list the most important factors in the purchase of friction and rubber tape. Almost unanimously they reported the above results.

***On both these points, PANTHER and DRAGON Friction and Rubber Tapes stand high***

- They are made by a company in the electrical insulation business since 1878.
- They are compounded and produced by the same research chemists and skilled workers that make world-famous Okonite and Hazard wire and cable products.

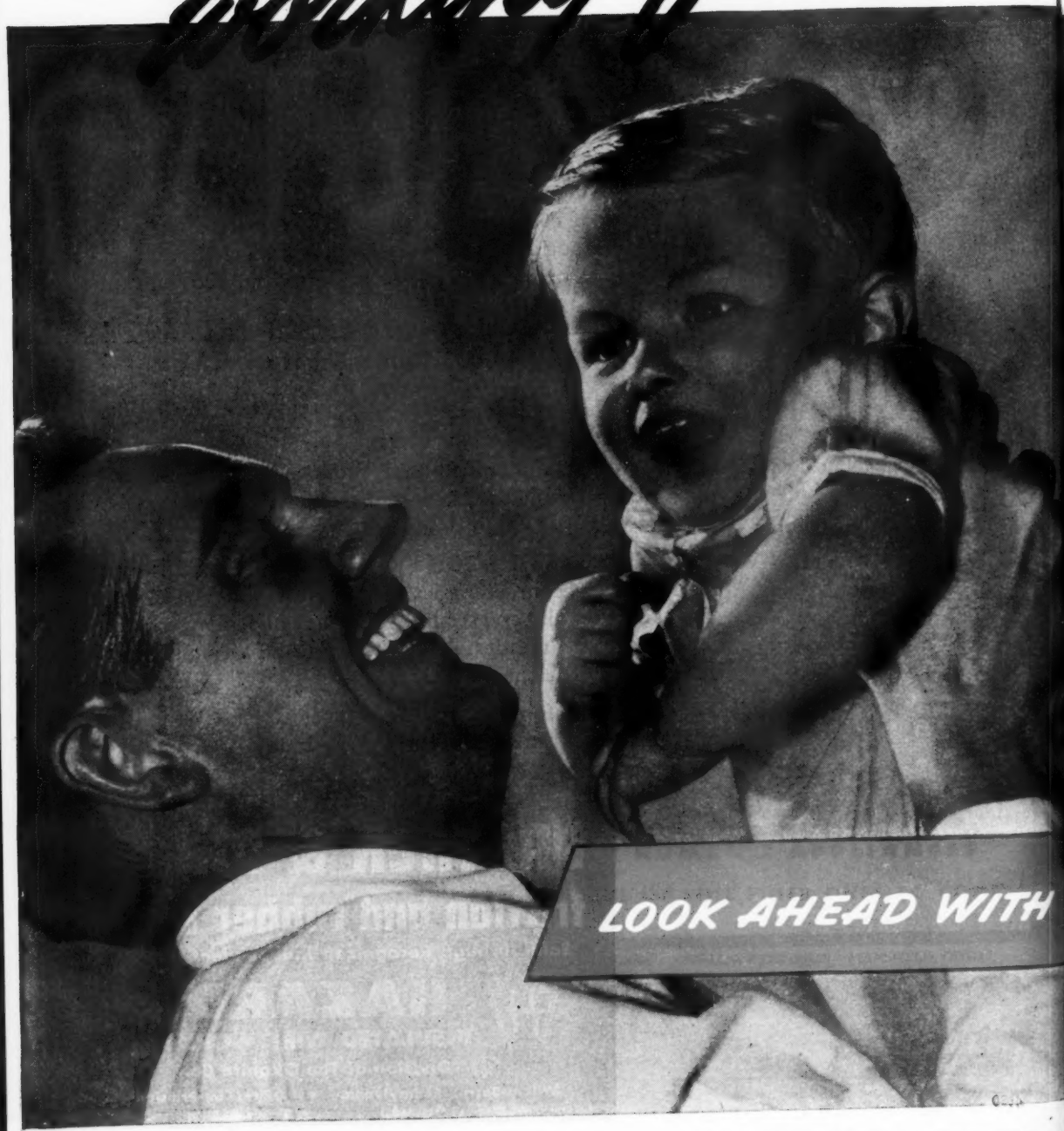
PANTHER and DRAGON Friction Tapes adhere firmly and have high adhesive characteristics. PANTHER and DRAGON Rubber Tapes fuse readily and securely and have high elongation and excellent electrical qualities. All tapes pass ASTM and Federal Emergency Specifications.

For complete information on these tapes — or for the address of your nearest recognized distributor — write today.

**PANTHER & DRAGON**
**friction and rubber TAPES**
*Sold Through Recognized Independent Wholesalers*

**HAZARD**
**INSULATED WIRE WORKS**
Division of The Okonite Co.
Wilkes-Barre, Pennsylvania • Offices in Principal Cities

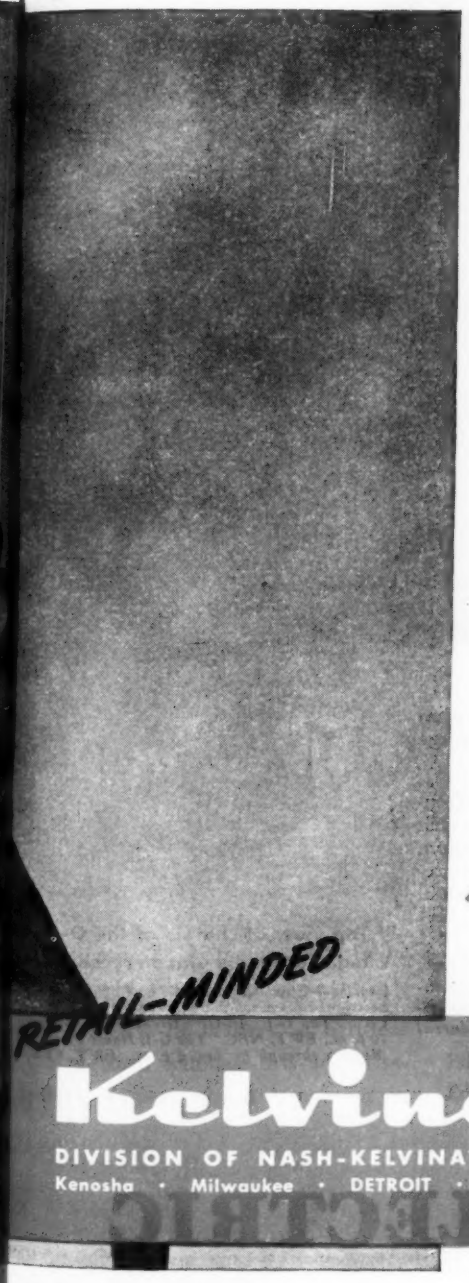
# What are You working for?



It's more than just living from day to day.

It's security and a better life for you and your family . . . an education and a sound future for your children . . . a business you can *build* with your heart and hands . . . a respected place in your community.

*These* are the things you're working for . . . whether an individual or a business organization.



And these are the reasons why the Kelvinator Franchise is a valued possession to that forward-looking group of men and organizations that hold it. For that franchise means a *future* . . . a *better* business life . . . protection against the vicious competitive selling practices arising from too many dealers, too many models, too few sales per retailer. It means a sounder business opportunity for the long pull.

That franchise means a higher standard of business and human relations because *the basis of Kelvinator's "Retail-Minded" thinking is that no sale has been completed until the product leaves the retailer's floor!* Every detail of Kelvinator's way of doing business supports this policy . . .

**More Sales per Dealer**—Yes, *more* sales per dealer because the Kelvinator *selective* distribution pattern . . . based upon *not* the most but the *finest* dealers . . . plans a market adequate to insure enduring, profitable returns on investments of time, money and effort.

**Simplified Product Policies**—A line of products so simplified and compact as to reduce retailers' investments in inventory. The Kelvinator line is confined to high-unit-of-sale, big volume products.

**Competitive Price Policy**—Kelvinator's aim will always be to maintain a price policy that is vigorously competitive . . . with higher units of sale assured by a proven step-up plan dramatizing visible, salable values at each step.

**Retail-Minded Merchandising**—Designed for *action*, Kelvinator advertising, sales promotion and sales training have one purpose—to move merchandise *off* the retailer's floor.

This is the meaning of "Retail-Minded" Kelvinator . . . a *better* way of business that gives you the things *you* are working for!

*The most Valuable Franchise in the Appliance Industry*

RETAIL-MINDED

Kelvinator

DIVISION OF NASH-KELVINATOR CORPORATION

Kenosha · Milwaukee · DETROIT · Grand Rapids · Lansing

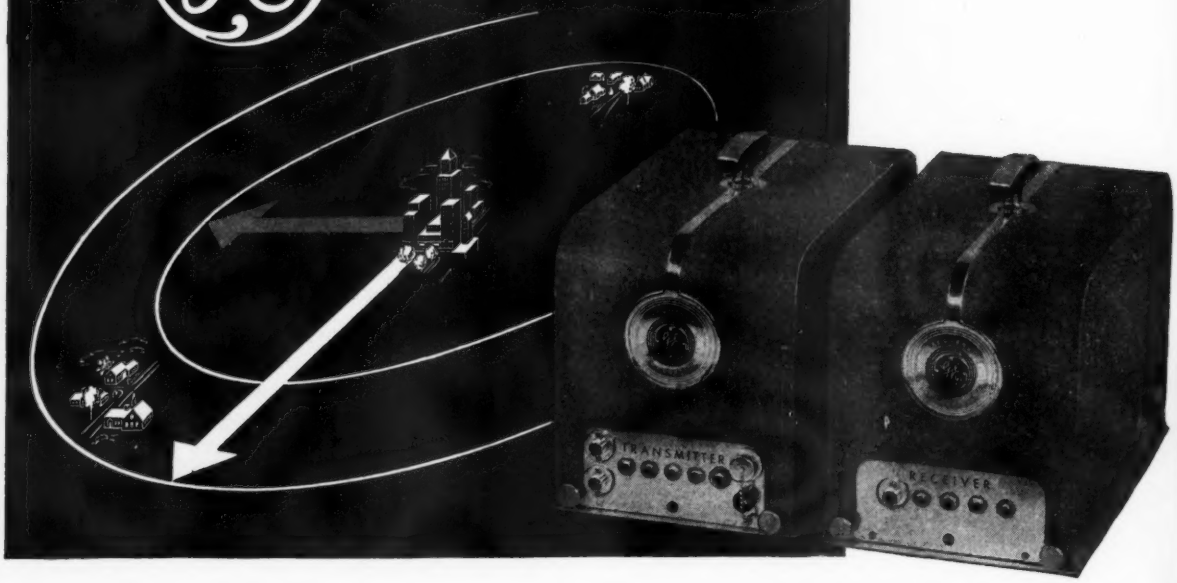
*Nash-Kelvinator's hit musical program Sundays 4:30 P. M., E. W. T. American Broadcasting Company.*

# Greater range...

## clearer reception!

## with G-E 2-WAY FM RADIO

- **Greater Communication Range**
- **Lower Battery Drain**
- **Improved Tuning Reliability**
- **Complete Accessibility**




**G-E 2-way FM radio** gives you greater mileage per watt, better coverage per dollar of investment, makes it possible to protect wider areas with greater dependability.

**Long-Range Coverage** — General Electric's high-sensitivity receiver pulls the message through — out to "the fringe" where signal strength may be as low as 0.5 microvolt or less.

**Accurate Message Reception** — General Electric's improved audio circuit, with the feature of inverse feedback, provides better voice quality, greater audio output, lower distortion —your assurance of clear, crisp message reception.

**Complete Standby Silence** — General Electric's highly effective squelch circuit mutes the receiver on all random noise during standby; opens the receiver on a signal input of 0.1 microvolt.

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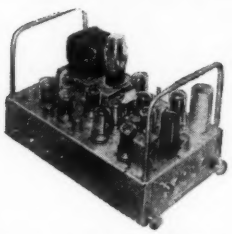
For additional information on G-E 2-way FM radio equipment, or for help concerning your particular communication problem, write: *Electronics Department, General Electric, Schenectady 5, N. Y.*



**Top view of chassis of the G-E high-sensitivity station receiver.**

*Hear the G-E radio programs: "The World Today" news, Monday through Friday 6:45 p. m., EWT, CBS. "The G-E All-Girl Orchestra," Sunday 10 p. m., EWT, NBC. "The G-E House Party," Monday through Friday, 4 p. m., EWT, CBS.*

***Everything for 2-way radio***

# GENERAL ELECTRIC

163-05-6818

Swing low
Sweet Kilowatt!
The cost of living has gone up like this—
BUT the price of electricity has come down like this!
Nobody needs to tell you that the cost of living has been climbing toward high C.
But maybe you do need a reminder that the cost of electricity has kept right on coming down the scale.
If yours is an average household, you're getting about twice as much electricity for your money today as you did 15 years ago.
And recent government figures show that the average price has continued to go down—even since war began. That fact ought to be music to your ears!
Keeping the quality of service up and the cost of service down is a real achievement in wartime.
It took a lot of planning, perspiration and practical business management to do this job. Everybody in the business had a part.
• Listen to "THE SUMMER ELECTRIC HOUR" with Robert Armbruster's Orchestra and guest stars. Every Sunday afternoon, 4:30, EWT, CBS Network.
167 ELECTRIC LIGHT AND POWER COMPANIES*
SELF-SUPPORTING, TAX-PAYING BUSINESSES
* Names on request from this magazine.
DON'T WASTE ELECTRICITY JUST BECAUSE IT'S CHEAP!

# HERE'S SOMETHING TO SING ABOUT!

THE above advertisement tells—in words and music—an astonishing wartime fact . . . that the cost of electricity has actually come *down* at the very time when the cost of almost everything else has gone *up*.

Millions of readers of national magazines will see this advertisement during July. It is another in the series sponsored by a large group of America's *business*-managed electric light and power companies.

This co-operative advertising also includes messages in farm publications and newspapers, and the popular radio program starring Nelson Eddy—"The Electric Hour." Mr. Eddy is vacationing now, but he'll be back in the fall. Meanwhile, tune in "The Summer Electric Hour"—with Robert Armbruster's Orchestra and guest stars—every Sunday afternoon (4:30, EWT) over CBS.

All of this advertising effort has a direct bearing on *your* industry, *your* company, *your* job. Follow it closely and discuss it with your friends.

**167 ELECTRIC LIGHT AND POWER COMPANIES***

SELF-SUPPORTING, TAX-PAYING BUSINESSES

* Names on request from this magazine.

# NOW Get the Right Varnish for that Insulating Job

*Quickly-Easily-Accurately...*

## WITH THIS HANDY VARNISH SELECTOR

# IT'S FREE!

## Ask your G-E Distributor for it

A quick glance at this handy, easy-to-use Varnish Selector gives you all the facts on 7 outstanding insulating varnishes — characteristics, applications, baking and drying time, base, thinner, viscosity — everything you want to know. Ask your local G-E Merchandise Distributor for one and you'll always have this essential information at your finger tips, ready to use. A list of G-E Distributors is available on request from Section RIM 452-23, Resin and Insulation Materials Division, General Electric Company, Schenectady 5, New York.

**SEND THIS COUPON NOW TO YOUR LOCAL G-E MERCHANDISE DISTRIBUTOR**

Gentlemen:

Please send me a G-E Insulating Varnish Selector as offered in Electrical South.

Name.....

Title.....

Company.....

Address.....

**GENERAL ELECTRIC**

# WHY?

## ARE HUBBARD NO. 4-11-44 WIREHOLDERS SO STRONG

When a dead-end load is applied to a Hubbard 4-11-44 Wireholder, the first thing that happens is a close conformation to the porcelain of the Copperweld wire bail, which runs around the wire hole. This distributes a compression load over the largest possible area of the porcelain. *The metal bail carries the load,* the porcelain merely rides the bail like a saddle.

This is evident on observing the construction of the Hubbard 4-11-44. But not so well understood, is how the bail-fastening to the base stands up so well. At first glance it would seem that increased loading would simply straighten out the hooked ends of the bail and cause them to let go. By referring to the diagram it will be seen why this is not so.

As the load is increased at "A" beyond normal strain, the base starts to "bow" up slightly at "D". Immediately the shoulders at "B" and "C" are drawn in against the bail "E", gripping it over a fairly large area, like the jaws of a vise. The harder the pull, the tighter the grip until the ultimate of the bail wire is reached.

*Tests have shown that before the bail breaks the normal mounting would long since have pulled loose. Attached to a solid beam of hard wood one Hubbard 4-11-44 Wireholder will support the weight of a light automobile.

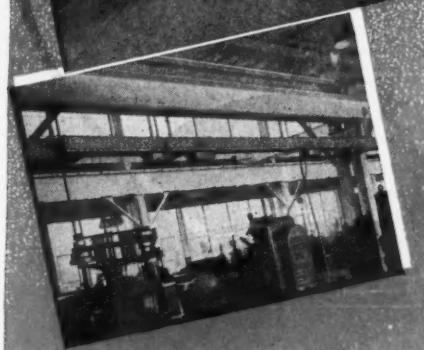
**The full strength of any wireholder will not be developed by a poor mounting. Thin siding, soft splintery wood or loose bricks will give way under a very low strain. Avoid weak mounting.*

**HUBBARD AND COMPANY**

PITTSBURGH . . . OAKLAND, CALIFORNIA . . . CHICAGO

# HOW TO SELECT POWER DISTRIBUTION

FOR SMALL PLANTS



AS WELL AS THE LARGEST

# BUSDUCT

**is designed for efficient plant layout and is unexcelled for changing plant conditions.**

Architects and engineers have found great, new possibilities in power distribution with (FA) Busduct — both Feeder and Plugin — for the smallest to the largest plants!

## Selection is Easy . . .

### *Just Remember These Advantages!*

The greatest value of Feeder (FA) Busduct is that it takes up a minimum amount of space for large capacity feeders. Used between generators and switchboards, between switchboards and distribution center, or from the service entrance to the distribution center it assures minimum voltage loss, plus permanent yet flexible service.

Plugin (FA) Busduct is the answer to *busy* manufacturers. No time is lost when equipment is added or moved . . . just plug-in and go! It reduces shut downs . . . speeds up reconversion! It eliminates tearing up and restringing long, expensive lead-ins when equipment is moved. Saves on Panelboard and Switchboard expansions when load is increased. And it is practically 100% salvageable if moved.

There is a (FA) District Representative near you. Write for his name and address, or see our catalog in Sweets. His experience in serving small manufacturers as well as the nation's largest companies will be helpful in planning your distribution system.

**FRANK ADAM ELECTRIC CO. • Box 357, St. Louis, Mo.**

*Makers of*

BUSDUCT
WIRE & CABLE DUCT
PANELBOARDS
SWITCHBOARDS
ENCLOSED SWITCHES
SERVICE EQUIPMENT

BUY THE SIGN OF (FA) 100% BETTER JOB

Frank Adam

ELECTRICAL PRODUCTS

FRANK ADAM ELECTRIC CO. ST. LOUIS, MO. U.S.A.

# ELECTRICAL SOUTH

VOL. 25 JULY 1945 NO. 7

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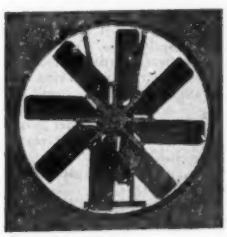
SOUTHERN POWER & INDUSTRY
COTTON
SOUTHERN HARDWARE

"When I sell Coolair Fans I know that I am giving my customers what they are paying for in air delivery, for . . .

"Each Coolair Fan has been rated according to the Standard Test Code adopted jointly by the American Society of Heating and Ventilating Engineers, the National Association of Fan Manufacturers and the Propeller Fan Manufacturers Association.

"Just one of many reasons why I've got so many satisfied customers who help me sell more Coolair Fans."

Coolair
TRADE MARK



NOTE: Priority rated orders still have first call on our production. Wise Coolair dealers will continue to sell fans on the highest possible priority ratings, so they can get reasonably prompt shipments on stock replacements and direct-to-customer orders.

WRITE For NEW COOLAIR CATALOG
showing photos and features of every type of fan in the Coolair line, with complete dimension and performance data—or consult catalog pages in
SWEET'S CATALOG A.S.H.V.E. GUIDE
or ELECTRICAL BUYER'S REFERENCE

AMERICAN COOLAIR CORPORATION...Manufacturers
3604 MAYFLOWER STREET
JACKSONVILLE 3, FLORIDA

# Choose Your Partner!

The sweet music of "Reconversion" is about to begin—so run your finger down the list below and choose your partner! Here are Premier's 79 distributors—the best in the land—waiting to join hands with you to bring the Premier Cleaner and the public together in your store. Find the distributor nearest you and get in touch with him now to plan your future with Premier. And remember . . ."A future with Premier is a future with Profits!"

## ★ THE PREMIER DISTRIBUTORS ★

*Akron, O.*, Sacks Electrical Sup. Co.
*Albany, Ga.*, Ferrell-Wight Co., Inc.
*Albany, N. Y.* ..... Albany Garage and Appliance Distributors, Inc.
*Allentown, Pa.* ..... Luckenbach & Johnson, Inc.
*Atlanta, Ga.* ..... Brown Distributing Co.
*Amarillo, Texas* ..... Southwestern Appliance Co.
*Austin, Tex.*, Calcasieu Lumber Co.
*Baltimore, Md.*, Jos. M. Zamoiski Co.
*Bangor, Me.*, Maine Industries Co.
*Birmingham, Ala.* ..... Steel City Supply Co., Inc.
*Bluefield, W. Va.* ..... Bluefield Supply Co.
*Brooklyn, N. Y.*, E. A. Wildermuth
*Buffalo, N. Y.*, W. Bergman Co., Inc.
*Burlington, Vt.* ..... Vermont Appliance Co.
*Cambridge, Mass.*, The Eastern Co.
*Casper, Wyo.* .... Casper Supply Co.
*Chadron, Neb.*, Casper Supply Co.
*Charlotte, N. C.*, A. K. Sutton, Inc.
*Chattanooga, Tenn.* ..... Harry W. Cameron, Inc.
*Cheyenne, Wyo.*, Casper Supply Co.
*Chicago, Ill.* ..... H. U. Mann Co.
*Cincinnati, O.*, Ohio Appliances, Inc.
*Clarksburg, W. Va.* ..... Van Zandt Supply Co.
*Cleveland, O.*, Midland Electric Co.
*Columbia, S. C.*, Carolina Sales Corp.
*Columbus, O.*, Ohio Appliances, Inc.
*Dallas, Texas* ..... Radio City Distributing Co.
*Davenport, Ia.* ..... Schneiderhahn's, Inc.
*Dayton, O.*, Ohio Appliances, Inc.
*Denver, Colo.* ..... Radio & Appliance Distributing Co.
*Des Moines, Ia.* ..... Schneiderhahn's, Inc.
*Detroit, Mich.* ..... Philco Distributors, Inc.
*El Paso, Tex.* ..... W. G. Walz Co.
*Erie, Penna.* ..... Young Bros.
*Fargo, No. Dak.* .... The Larson Co.
*Fort Lauderdale, Fla.* ..... McDonald Electric Co., Inc.
*Gettysburg, Penna.* ..... M. A. Hartley & Co.
*Grand Rapids, Mich.* ..... Radio Equipment Co., Inc.
*Great Falls, Mont.* ..... Great Falls Paper Co.
*Greenville, N. C.* ..... Carolina Sales Corp.
*Harrisburg, Pa.* ..... Penn Appliance Distributors
*Hartford, Conn.* ..... Wood-Alexander & Co.
*Honolulu, Hawaii* ..... Williams Equipment Co., Ltd.
*Houston, Tex.* ..... Straus-Bodenheimer Co.
*Huntington, W. Va.* ..... Van Zandt Supply Co.
*Indianapolis, Ind.* ..... Radio Equipment Co., Inc.
*Jackson, Miss.*, Cabell Electric Co.
*Jacksonville, Fla.* ..... Southern Hardware & Bicycle Co.
*Kansas City, Mo.*, Jenkins Music Co.
*Knoxville, Tenn.* ..... Harry W. Cameron, Inc.
*Laramie, Wyo.*, Casper Supply Co.
*Little Rock, Ark.*, McGregor's Inc.
*Long Beach, Cal.* ..... Gough Industries, Inc.
*Los Angeles, Cal.* ..... Gough Industries, Inc.
*Louisville, Ky.* ..... Peaslee-Gaulbert Corp.
*Lubbock, Tex.* ..... Southwestern Appliance Corp.
*Memphis, Tenn.*, McGregor's, Inc.
*Miami, Fla.* ..... McDonald Electric Co., Inc.
*Milwaukee, Wis.* ..... Roth Appliance Distributors, Inc.
*Minneapolis, Minn.* ..... The Roycraft Co.
*Monroe, La.* ..... United Electric Service
*Montgomery, Ala.* ..... Steel City Supply Co., Inc.
*Nashville, Tenn.* ..... Harry W. Cameron, Inc.
*Newark, N. J.*, L. R. Beavis & Co.
*Newburgh, N. Y.* ..... Shapiro Sporting Goods Co.
*New Orleans, La.*, Walther Bros. Co.
*New York City, N. Y.* ..... Gross Distributors, Inc.
*Norfolk, Va.* ..... Commonwealth Sales Corp.
*Oklahoma City, Okla.* ..... Hales-Mullaly Co.
*Omaha, Nebr.* .... Sidles Company
*Orlando, Fla.* ..... Robertson Supply Co.
*Philadelphia, Pa.* ..... Elliott-Lewis Electrical Co., Inc.
*Phoenix, Ariz.* .... W. G. Walz Co.
*Pittsburgh, Pa.* ..... Electric Products, Inc.
*Portland, Me.*, Maine Industries Co.
*Portland, Ore.*, Sunset Electric Co.
*Providence, R. I.*, The Eastern Co.
*Rapid City, S. D.*, Casper Supply Co.
*Richmond, Va.* ..... Commonwealth Sales Corp.
*Rochester, N. Y.* ..... O'Donnell-Dunigan Co.
*Saginaw, Mich.* ..... Northern Supply Co.
*St. Louis, Mo.*, Interstate Supply Co.
*Salt Lake City, Utah* ..... Flint Distributing Co.
*San Antonio, Texas* ..... General Hotel Supply Company
Southern Equipment Company
*San Francisco, Cal.* ..... H. R. Basford Co.
*San Diego, Cal.* ..... Gough Industries, Inc.
*Santa Barbara, Cal.* ..... Gough Industries, Inc.
*Savannah, Ga.* ..... Tuten & Long
*Scotts Bluff, Neb.*, Casper Supply Co.
*Seattle, Wash.*, Sunset Electric Co.
*Sheridan, Wyo.*, Casper Supply Co.
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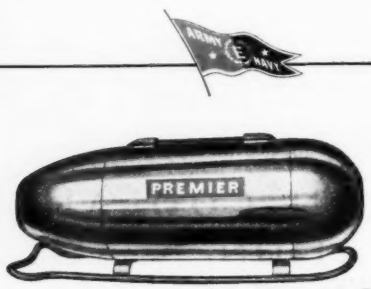
*So. Bend, Ind.*, Radio Equipment Co.
*Spokane, Wash.*, Sunset Electric Co.
*Staunton, Va.*, M. A. Hartley & Co.
*Syracuse, N. Y.* ..... E. M. O'Donnell Co.
*Tampa, Fla.* .... Electric Supply Co.
*Thief River Falls, Minn.* ..... The Larson Co.
*Toledo, O.*, Philco Distributors, Inc.
*Tulsa, Okla.* .... Hales-Mullaly Co.
*Washington, D. C.* ..... Columbia Wholesalers, Inc.
*West Palm Beach, Fla.* .... McDonald Electric Co., Inc.
*White Plains, N. Y.* ..... Behrer-Nason Co., Inc.
*Wichita, Kan.*, The Steve Wise Co.
*Wilkes-Barre, Pa.* .... R. B. Wall Co.
*Wilmington, Del.* ..... Garrett-Miller Co., Inc.
*Worcester, Mass.* .... The Eastern Co.
*Worland, Wyo.*, Casper Supply Co.




**PREMIER**

*"All That the Name Implies"*

ELECTRIC VACUUM CLEANER CO., INC. • CLEVELAND 10, OHIO

# Home Planners Institute Assures Ready Market For Adequate Wiring and Home Appliances

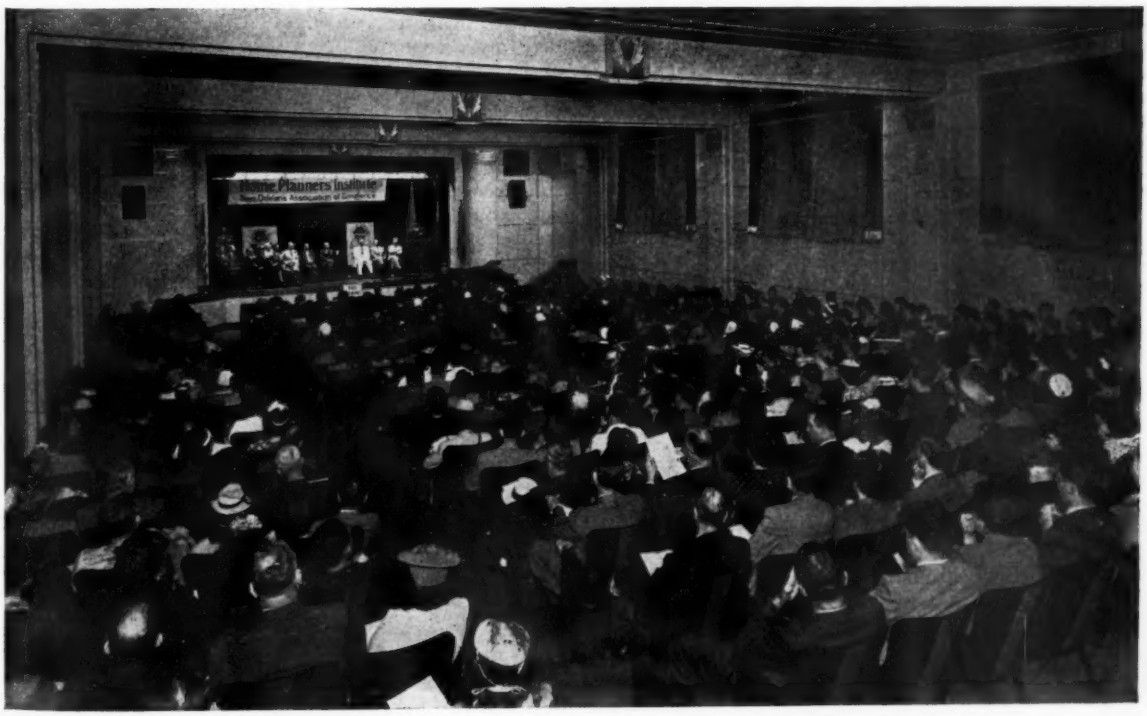
THERE is little doubt that as building materials and home appliances become available there will be a tremendous number of families who need this equipment and have the money to buy it.

In order that there will be no delay in getting such a building program under way, business men of New Orleans are making certain that a sizeable number of families will know exactly what they want and will be ready to go ahead with their building program. This is being accomplished by a free course in home building for which nearly a thousand persons have already enrolled.

Designated as the Home Planners' Institute, the course will include 12 lectures, covering every phase of home planning and extending over a period of a year. The subjects to be covered in detail include: selecting home site, financing; designing the home, hobbies, recreations and landscaping; contractors; kitchen planning; building materials; heating, ventilation, insulation, and air conditioning; plumbing; electric wiring and fixtures; interior and exterior painting, decorating; household appliances and new home features, and house furnishings.

Although the New Orleans Home Planners' Institute is sponsored by the Home Development Committee of the New Orleans Association of Commerce, more than 40 business firms, individuals and associations contributed to the $14,000 fund required to pay the incidental expenses of the Institute.

The electrical industry of New Orleans has taken a particularly active part in promoting this educational program. E. N. Avegno, of New Orleans Public Service, Inc., is chairman of the committee on finances, budget and fund raising. W. A. Feuillan, Jr., of the Lighting Fixture and Electric Supply Co., is chairman of the committee on accommodations and litera-




**Prospective home builders in New Orleans turn out for the Home Planners Institute, sponsored by New Orleans Association of Commerce, New Orleans Public Service, and others.**

ture. Others in the electrical industry of New Orleans taking part in the program are: E. H. Mowen, A. B. Lindauer, W. B. Nourse, G. R. Couvillion, J. R. Guidroz, A. L. Bosch, Ed Stacy, Carl O. Brown, C. C. Walther, and Walter Murphy.

The first class was held May 1st with an overflow attendance of more than 700. Classes are to be limited to 500, however, and additional classes will be started as the demand increases. The objective of the Institute is to educate approximately 2,000 future home builders.

Each monthly class will include lectures, charts, literature, and a question and answer panel on each phase of home construction. The classes are free to the prospective home builder in consideration of his pledge to build as soon as materials are made available and on his assurance that he has a lot, owns war bonds or a savings account, and will save systematically for a home.

The classes will not include any sales talks nor will anything be offered for sale. The lecturers are outstanding men and women in their specialized fields, chosen by their own trade associations or professional groups.

**Valuable Data from Registration**

The registration cards which must be filled in by each person signing up for the course includes information that will provide the Home Development Committee of the Association of Commerce with an authoritative picture of the postwar building plans of the people in this area. In addition to information as to address, occupation, etc., it provides blanks where the applicant indicates size and location of lot, approximate amount in savings for building purposes, preference in type of house, approximate value of house to be built, number of rooms and baths, and present ownership of electrical appliances and automobiles.

An extensive advertising program in local papers introduced the Institute and further publicity was obtained by conducting an essay contest for school children. The latter were required to start their composition with the phrase "I will ask my parents to enroll in the Home Planners' Institute because . . ."

Another incentive to enrollment was a handsome scrapbook distributed to everyone taking the course. The scrapbook is fitted with pockets for filing and preserving literature, ideas, etc., on home planning. Regular attendance at classes is encouraged by the awarding of attendance prizes which include subscriptions to home magazines, merchandise, and occasional humorous items such as a live pig, etc. More substantial prizes are planned for those attending at least 10 of the meetings. These will be awarded at the last of the twelve classes.

# How To Sell More Foot-Candles

**By Roy A. Palmer***

IN THE DAYS to come, after the war, there will be a great demand for new lighting of all kinds. Some of that new lighting will be good because it was designed to measure up to modern standards. A lot of it will be satisfactory only because it is new and will later be found to be only a mediocre installation that will need to be revamped in order to bring it up to the standard that it should have been when first installed.

Everyone will, of course, want the fluorescent lamp. The light output is higher per watt consumed than that of incandescent lamps. Since the 40-watt fluorescent lamp is the most efficient (excepting the new slimline lamps recently announced), and is dimensionally most adaptable to present fixture design, it is the most generally used. When we consider that 40 watts is a relatively small amount of energy to provide light, it can easily be understood why a larger number of fluorescent lamps are required over incandescent lamps to make an improvement in foot-candles notwithstanding their higher efficiency. Table I shows the number of 40-watt fluorescent lamps necessary to provide approximately the same lumen output as standard incandescent lamps.

Let us assume that a room 20 ft. x 40 ft. is equipped with 2 rows of 4 outlets each spaced 10 ft. apart and 5 ft. from the sidewalls. If each outlet is equipped with a 300-watt lamp in a semi-indirect fixture, the resulting illumination will be approximately 12 foot-candles. If in place of this installation, we substitute fixtures having only 40-watt fluorescent lamps, about 16 foot-candles will be obtained. This improvement is not sufficient to justify the investment in new equipment. At least four 40-watt lamps should be used in each fixture which will provide about 22 foot-candles. However, this level of illumination is not high according to present day standards. A better result will be obtained if fixtures are used having six 40-watt lamps which will furnish a level of 30 foot-candles.

If we keep in mind that the customer is buying illumination, not just fixtures, lamps, and energy alone, we will do a more constructive job for him by selling the job which makes a real improvement in illumination. The initial investment in equipment is higher but the cost per foot-candle is less. If the lighting standard is higher, the installation will serve a longer period of time. A sub-standard job will invariably be replaced by another investment in equipment much sooner.

While 30 foot-candles can be considered good illumination today, levels of 50 to 100 foot-candles will become generally common after the war. Since fixtures become bulky and expensive when designed to accommodate more

(*Continued on page 81*)

***Mr. Palmer is advertising and merchandising manager for Duke Power Co., Charlotte, N. C.**

**TABLE I**

**Number of 40-watt Fluorescent Lamps Required to Approximate Light Output of Standard Incandescent Lamps.**

| Incandescent Lamps | | 40-Watt Fluorescent Lamps | | |
|---|---|---|---|---|
| Watts | Lumens | Number | Watts* | Lumens |
| 150 | 2600 | 1 | 40 | 2100 |
| 200 | 3650 | 2 | 80 | 4200 |
| 300 | 5850 | 3 | 120 | 6300 |
| 500 | 9850 | 4 | 160 | 8400 |
| 750 | 15000 | 7 | 280 | 14700 |
| 1000 | 21000 | 10 | 400 | 21000 |

***Not including ballast losses.**

# INCREASE SALES BY RELATED DISPLAY IN MODERN APPLIANCE CENTER

IT IS PROPOSED and substantiated by sound thinking that up to date merchandising of small electrical appliances, major appliances, and certain non-electric homewares will meet with considerable success if they are brought together in an area that can be called an "Appliance Center" in department stores, furniture stores, or utility company stores.

Obviously, a choice of strategy must be made according to the type of store employing this principle of promoting multiple sales through related display. For example, the furniture store might place its radio display within this section with space allowed for television demonstration to border a display of table and floor model radios. A turn-table for record trial might well be in this area and, if where sales and consumers warrant, record-listening booths can be incorporated.

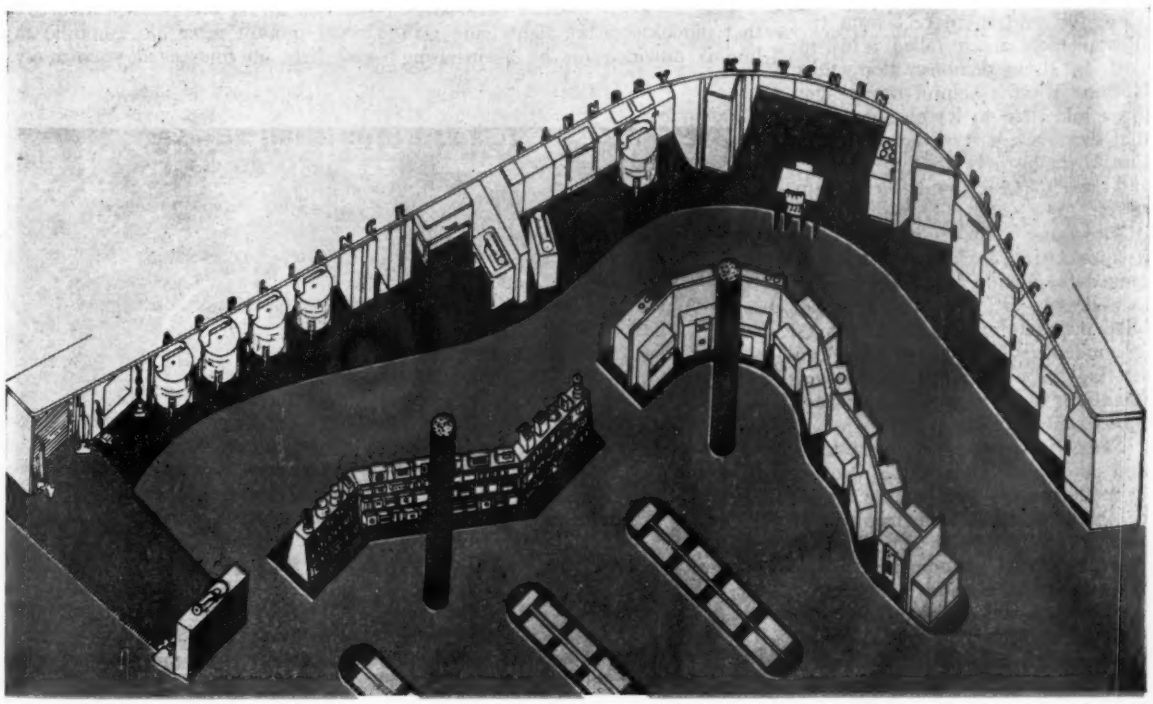
**MANY practical ideas on the design of an "Appliance Center" for department stores, furniture stores, and light and power company displays, are to be found in the report on "Moderneering" compiled recently by Landers, Frary and Clark, appliance manufacturers, from which this article has been adapted.**

On the other hand a department store could use the space adjacent to its major appliances to display more of its related small appliances and homewares.

A utility company store or show room will find here basic points of arrangement and location, in whole or in part, which can be employed to advantage for modern, multiple sales strategy.

The point of entrance leads across the demonstration area for home cleaning equipment. This is marked by a large carpeted area safely fastened to the floor and joining two related displays with venetian blinds and drapes, which invite a demonstration of vacuum cleaning accessories, extensions, brushes, and the like. The carpeting itself offers much for in-use demonstration of tank cleaners, upright vacuum cleaners, and carpet sweepers.

Stepping from harder surfaced flooring to carpet, customers will be



**Contrasting color patterns in linoleum may be employed to good merchandising advantage in featured display areas of "Appliance Centers" in department stores, furniture stores, light and power company displays, etc. In selecting pattern and color for floors, take note that large areas should be covered in a lighter pattern with harmonizing color contrast in linoleum for tops and counters. Flowing lines will contribute to the sales strategy which guides customer interest subconsciously along a preconceived pattern of traffic movement.**

arrested by the sense of "something different" underfoot and the demonstration of cleaners fulfills their awakened interest. A display of floor polishers set along the wall completes the home cleaning equipment setup.

A markedly zig-zag display section for small appliances helps direct traffic and by contrast emphasizes the display of major laundry equipment and electric water heaters that runs along the wall opposite, leading to home laundry and kitchen demonstration areas.

**Value of Demonstration Units**

In working up demonstration units for major appliances, laundry and kitchen, it is advisable to create as much of an actual home atmosphere as possible. Your customers will feel more comfortable under such conditions and will begin to envisage possession and use of featured equipment in their own homes. This is good merchandising that can be turned into profits by adroit salesmanship.

Continuing emphasis is again obtained by contrast of curving display section of ranges with a sawtooth display along opposite wall where other major appliances are set up in such a way as to invite individual inspection while they remain part of mass display that is invitingly close to the kitchen demonstration feature.

For full impact, make certain that all appliances are installed ready for work in these demonstration units. Nothing is more helpful toward closing a sale than to let customers feel that they are a part of the demonstration by being permitted to see, feel, and operate the appliances themselves.

This basic plan for multiple sales in an electrical appliance center is arranged to provide for traffic freedom as well as guided sales strategy for related merchandise. Customer interest is guided, subconsciously, by contrasting lines of display which direct attention along a pre-conceived pattern of movement.

Since increased consumer traffic and purchase volume is the objective of moderneering, and because the use of linoleum is recommended as an implement for traffic guidance, its ease of upkeep, maintenance of original appearance, and long-wearing qualities are factors important to every store owner.

It is suggested here that a technique of contrasting color patterns may be employed to good merchandising advantage in featured display areas. Counter and display fixture tops covered with non-marring, easily cleaned linoleum patterns in this technique will further engage consumer interest and suggest examination at point-of-purchase.

In selecting pattern and color for floors take note that large areas should be covered in a lighter pattern with harmonizing color contrast in linoleum for tops and counters. Darker patterns in harmony, will give bright emphasis to any mass display of major appliances. Flowing lines will contribute to the strategy of breaking from one color to another. Feature strips help to highlight interest toward selected areas.

The use of Celotex interior finish materials helps to identify the appliance center as an individualized merchandising area and thereby tends to intrigue store traffic and encourage inspection of the major and related appliances on display.

The straight line background for major appliances at left of main traffic entrance is developed by using Celotex Standard Building Board with pilaster treatment at each four-foot joining. This establishes a quiet dignity that accents the major appliances featured here. A wide choice of wall treatment and design is also possible, Celotex Tile offering many variations in classical pattern that might be equally effective in general harmony with overall store interior.

The sawtooth pattern of strategy that moderneers the right hand wall line is provided for by again using Celotex Standard Building Board—this time applied to light, inexpensive wood framing, reinforced, and angle-strapped in back at sawtooth joinings.

Straight line wall in area above these major display planes or panels would of course follow choice of treatment used for other wall surfaces in this appliance center.

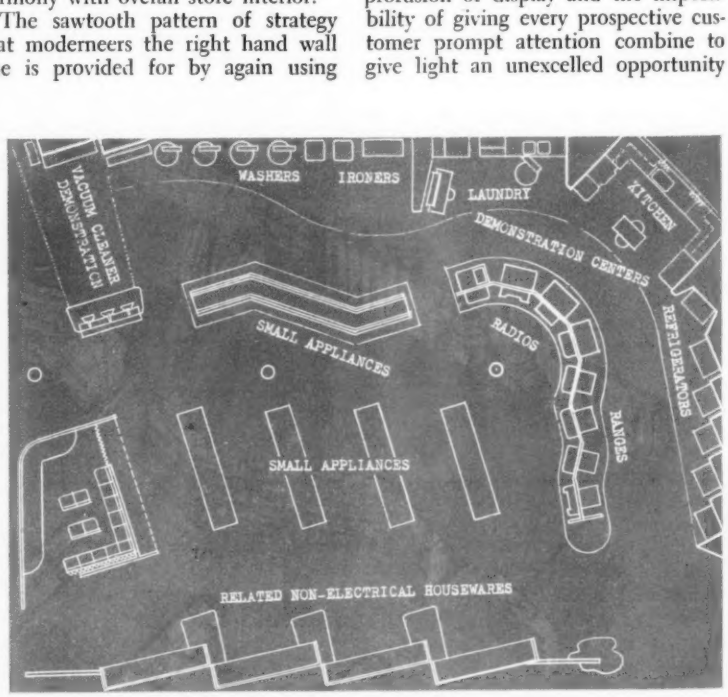
Ceilings of Celotex Acoustical Tile, if radio and record departments are incorporated here, will provide a subtle harmony to color and lighting strategy by emphasizing interior layout pattern of merchandise rather than ceiling design.

The use of such materials presents a speedy, inexpensive development of walls and ceilings which are excitingly effective from the "Moderneering" point of view. This tough cane fabrication can be easily carved, cut, grooved or beveled to provide any number of pattern possibilities in keeping with the pre-conceived strategy of store layout.

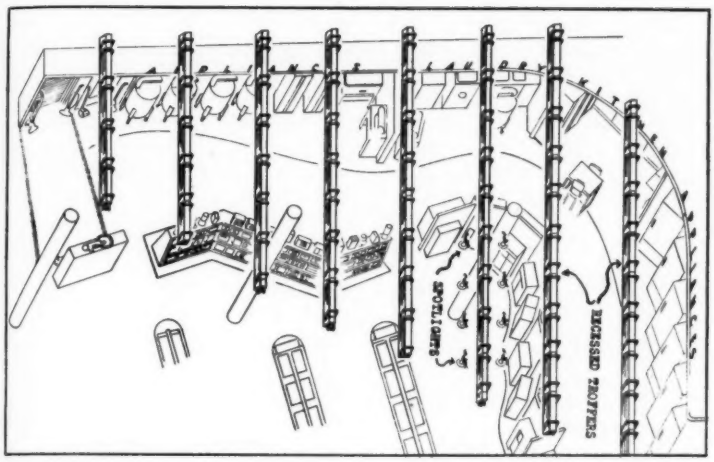
**Light—The Silent Salesman**

Failure to fully employ light as a silent salesman is always a merchandising error. Nowhere can light sell more effectively than in retail departments covering a large area.

In such instances, the extraordinary profusion of display and the impossibility of giving every prospective customer prompt attention combine to give light an unexcelled opportunity




**The basic plan for multiple sales in an electrical appliance center must be arranged to provide for traffic freedom as well as guided sales strategy for related merchandise. The plan shown here has been designed to accomplish these objectives. The laundry and kitchen demonstration units in the upper right hand corner should be arranged so as to create as much of an actual home atmosphere as possible.**




**The design of lighting for the appliance center requires consideration of many factors, such as ceiling height, wall and ceiling colors, etc. The combination shown here can be used to advantage, however, in most appliance centers. It consists of continuous rows of fluorescent lamps spaced as required by ceiling height to provide proper intensity at the display counter level. This is supplemented by spotlights on adjustable brackets to give added punch to special displays.**

to work automatically for its user. In the accompanying drawing, in which the proposed lighting layout is an integral part of store modernization, light is superbly harnessed to do its selling job in department stores.

General illumination is here provided by evenly spaced rows of fluorescent lights. Each row is continuous and extends from one side of the department to the other. This arrangement assures adequate shadowless illumination on merchandise.

The fluorescent lighting is installed directly into the ceiling by means of recessed troffers equipped with a frosted glass diffusing panel or with open louvers. Each troffer unit contains two 40-watt fluorescent lamps.

This distinctive pattern of fluorescent lighting is desirable not only from the viewpoint of lighting a department, but also as a visible means of relating the lighting in the department to that of other departments on the same floor.

The illustrated illumination scheme includes incandescent spotlights which are positioned over all focal selling sections of the department. Spotlights (indicated for a single section) are completely flexible. They can be readily attached to outlets in any section of the department and thus employed to highlight and dramatize special sale merchandise.

Each troffer unit measures approximately 49 inches in length (to accommodate the 48-inch long 40-watt lamp). Width of the unit is kept within 12 inches so that the lighting system is readily accommodated in the Celotex tile ceiling. Ordinarily, ten feet intervene between rows of lighting.

The incandescent spotlights connected to conventional outlets are recessed into the ceiling in a space equivalent to one Celotex Tile. Spotlight outlets are arranged in rows and are located at regular intervals over the entire ceiling area. This permits the spots to be utilized over any section of the department.

The development of a third wall and display area for the appliance center places a greater emphasis on merchandise than on fixture display patterns. This is accomplished by simplicity in arrangement and proportion without applied decoration.

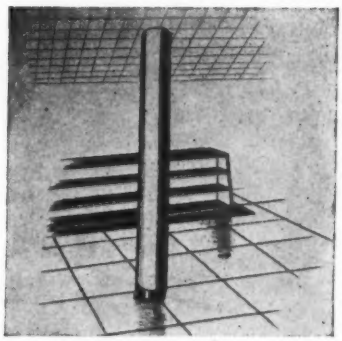
Since Moderneering has projected a combined display of small electric and non-electric homewares, neighboring an area where major appliances are featured, the basic strategy of "sawtooth pattern" that emphasizes major appliances has been made a structural part of the display shelving as well.

This principle works well in providing individualization for open boxes along the wall just as much as in the previously determined panel planes Maximum visibility is maintained at all times in line with the predominant flow of traffic.

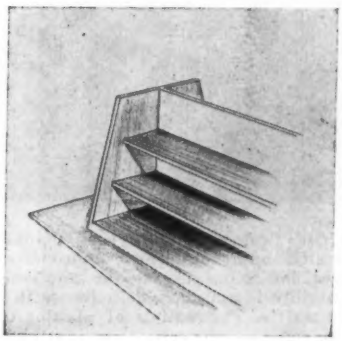
The wall is of plastic; the fixtures of natural wood, dull finish, to provide accent by contrast with the appliance displayed here.

The platforms 30 inches from floor and directly associated with staggered wall shelving suggest full inspection of merchandise. They are not designed primarily for display but, instead, to give space for placement of items under inspection without clouding the purchase with counter-barriers.

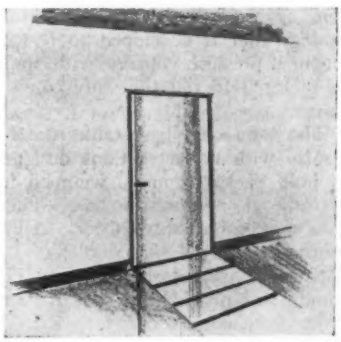
Columns of metal tubing support the cantilevered shelves, the wall cases, and spotlights above—include also the wires directed to spotlight



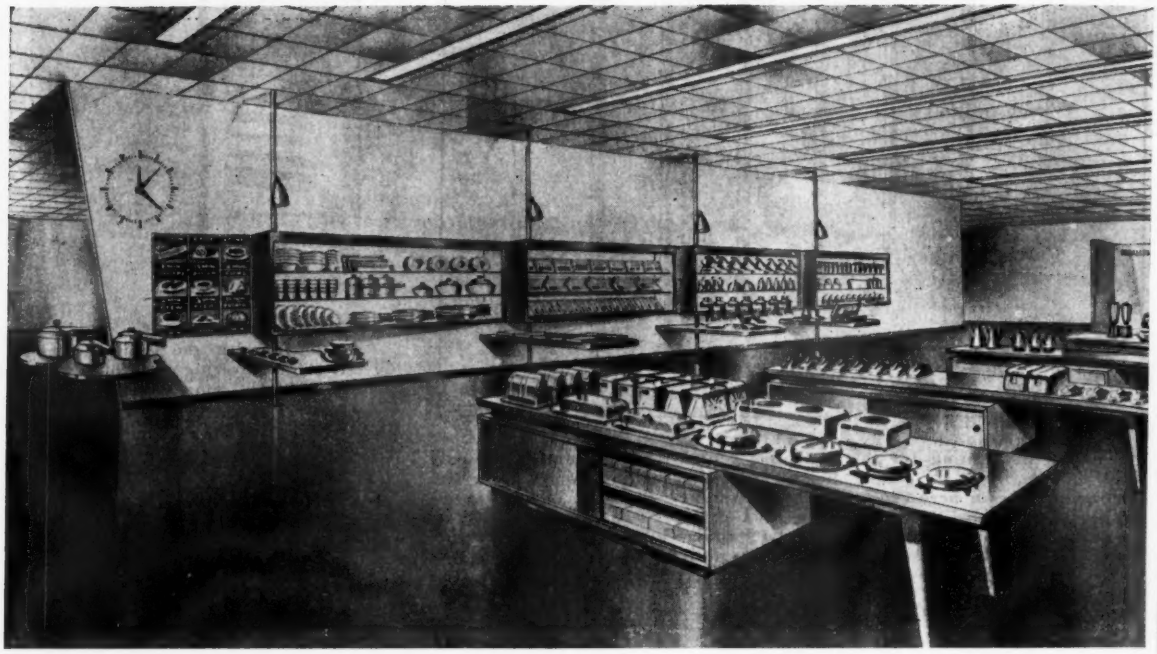
**Many practical uses for linoleum can be found in the appliance center. As a covering for columns it has a sleek, modern appearance.**



**Cases and shelves for small appliances and radios can be covered with linoleum in colors contrasting with that of the floor.**



**For areas that receive heavy duty wall linoleum offers many advantages. Note neat appearance of wall and door covered in this way.**



**Artist's conception of well planned display for small electric and non-electric housewares department for an area bordering the major appliance display. Maximum visibility is maintained in line with the predominant flow of traffic. The wall is of plastic; the fixtures of natural wood, dull finish, in order to provide contrast with the items on display. The semi-open base tables are for display with under sections designed to hold packaged units, ready for delivery. There is a noticeable absence of selling counters—sales personnel stand beside customers.**

installations. Open, sawtooth shelving 7 inches high overall is bolted to the plaster wall. A flange from pipe to underside of shelf-platforms secures each shelf; cleats fasten them to wall.

"Time" display clock is suggested here as a part of a merchandising strategy that is developed to feature the new pressure cookers—with framed pictorial to tell the story conveniences.

The semi-open base tables are for display with under sections designed to hold packaged units, wrapped for delivery at point-of-purchase. There is a noticeable absence of "selling counters."

Sales personnel stand beside customer, and not behind sales barriers. No place is empty, therefore, if clerks are not immediately at hand, and the instinct to shop around is thereby encouraged—becoming an effective selling tool.

These display tables are made in 3 pieces to facilitate shipments, installation, and arrangement.

Completing the overall effectiveness of this area, our floor plan diagrams a demonstration center immediately adjacent to display counters and the nearby open shelf features. It is here that smaller electrical appliances are introduced to consumers in a well-staged, informal manner which carries out the same thinking that supports the sales-effectiveness of atmosphere demonstrations for major appliances.

# Adequate Wiring and Lighting Program Planned for Virginia Schools

SCHOOL BUILDINGS in Virginia, which are unwired for electricity, will now be wired as a result of a visual educational program started when the Virginia legislature appropriated $1,112,000 for that purpose in May. Records indicate that 2116 schools in Virginia are not wired for electricity.

The money will be used for the purpose of movie projectors, screens, sound equipment and associated apparatus as well as for the wiring of the unwired school buildings.

Plans and specifications for installing electric wiring and lighting in each of the schools are now being prepared by state officials. The new school appropriation becomes effective July 1. It will provide for the expenditure of $2 for each pupil enrolled. Most of the appropriation will be spent for projectors and film equipment.

Much of the wiring and installation of lighting fixtures in schools unwired may come from other state funds. The jobs will be subject to bid from state contractors.

Some of the schools are in isolated sections far from power lines of any kind but Governor Darden announced that he had conferred with Virginia power officials and that extensions of lines were planned so that power for the remote schools may be expected soon.

Virginia leads all other states in visual education, state educators said, but only 450 schools in the state are wired or are equipped for the use of the audio-visual equipment. The state has a free instructional film service.

The intensive program for visual education launched by the appropria-

*(Continued on page 80)*

# Refrigeration Firms Good Prospects For Vapor-Proof Installations

WITH NEW civilian construction at an all-time low, one Mississippi contractor has developed a lucrative activity by selling vapor-proof type re-wiring installations to commercial refrigeration firms.

He is A. A. Ludke, of the Ludke Electric Company, Vicksburg. Late in 1943 he terminated a connection of many years with the U. S. Engineers, in the Vicksburg office, and in January of 1944 launched the new contracting firm. By building solid volume with substantial profit in the ensuing year and some months, he has demonstrated that war-time restrictions are not such a handicap for the contractor who goes after business.

Ludke's experience with the U. S. Engineers, where he supervised vapor-proof installations on many river vessels of from 15 to 200 tons, taught him valuable lessons that he has applied to contracting.

Service for locker plants and commercial cooling rooms has already produced a number of such contracts and Ludke expects this line of work to develop as his service volume increases.

Locker plants and packing plants experience inevitable and recurrent trouble with ground shorts where the wiring is of standard type. To clear up grounds at one such plant required eight service calls in 90 days. Another plant spent $125 on repairs, seeking to maintain service with standard wiring, before deciding on installation of vapor-proof lighting and lead cable at a cost of $550. That job will make business for many other contractors, because the company's Chicago inspector praised the installation and declared his firm would want many more like it.

It is relatively easy, says Ludke, to point out to a commercial customer in the refrigeration business that money spent on old installations that are vulnerable to condensation would soon pay for a modern vapor-proof installation.

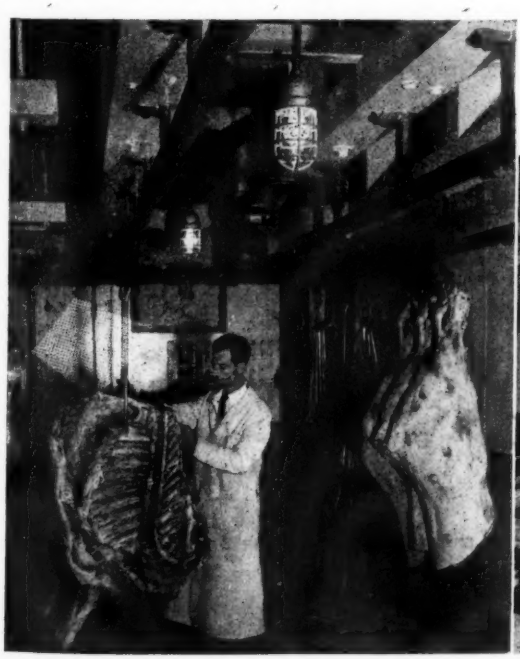
"They can be shown," says Ludke, "because interruptions in their service are costly, particularly to their reputation. They can also be shown the danger of an expensive damage suit that could result from the death or serious injury of an employee or customer, from a faulty wiring system.

"On the other hand, the domestic customer usually wants the cheapest job he can get. So I made it a rule to specialize on commercial and industrial work. I don't take a house job except to accommodate an industrial customer."

Ludke uses a plant at Tullulah, La., to illustrate the futility of an original installation in which standard type R wire, with outlet boxes and conduit, was used. The installation was made in 1943 at a cost of $200. Since it developed ground troubles a year later, the service of Ludke's firm has been required on seven different occasions. As a consequence, Ludke now has a contract for a complete new vapor-proof installation for this plant.

Trouble with standard wiring in refrigeration or locker plants is inevitable, Ludke points out, because condensation eats out insulation. Soon the standard installation is stopped up from condensation, permitting further condensation to short out the

*(Continued on page 81)*



**A. A. Ludke, contractor of Vicksburg, Miss., who has found a lucrative field in selling vapor-proof installations to commercial cooling firms. Below, Mr. Ludke displays the key equipment in his program, a moisture-proof lamp fitting and a section of lead cable. At left, one of the Ludke installations in a Vicksburg packing plant.**

# LIMITATIONS OF DIELECTRIC HEATING

By Carl J. Madsen*

WITH THE POPULARITY of high-frequency heating growing by leaps and bounds, it is desirable to stop for a moment now and then to take stock of the state of the art. This can best be done by breaking down the broad view and reviewing only a narrow phase at a time. This article is concerned with only dielectric heating (heating of materials by a varying electric field), and reviews the major limitations that prevent universal application.

In considering these limitations, it must be understood that almost all of them are interlocked, to some degree with each other. Hence, in discussing each individually it is well to remember these inter-relations when considering an actual application.

### Cost of Dielectric Heating

High frequency energy is not a cheap source of heat. In terms of dollars per kilowatthour, it will cost approximately $0.025 to $0.04 including direct operating cost, maintenance and amortization.

It becomes economical by virtue of one or more of these factors:

(1) It produces a result not possible by other methods of heating.

(2) It increases the speed of a process and saves labor and/or overall equipment cost.

(3) It produces or confines the heating in the part or point where needed, thus reducing overall power consumption.

(4) It is clean and compact.

(5) It reduces rejects, or improves the production quality of a product.

(6) It is flexible in its application to a variety of operations, processes or products.

These factors are often of sufficient importance to make an application economically attractive.

### Materials for Which Applicable

Dielectric heating is applicable only to materials normally considered poor conductors of electricity or insulators. When the electrical resistivity of a material drops below 1000 ohms per centimeter, it is usually possible or necessary to use some technique other than dielectric heating. The state and characteristics of the material have considerable influence on the division point, changing it as much as 10 to 1.

The rate of heating in any given dielectric material varies directly with the area of electrode, the frequency, the square of the RMS voltage applied, and inversely with the thickness of material. The rate of heating in any given dielectric material is further modified by the "loss factor" of the material. The following paragraphs discuss briefly each of these factors.

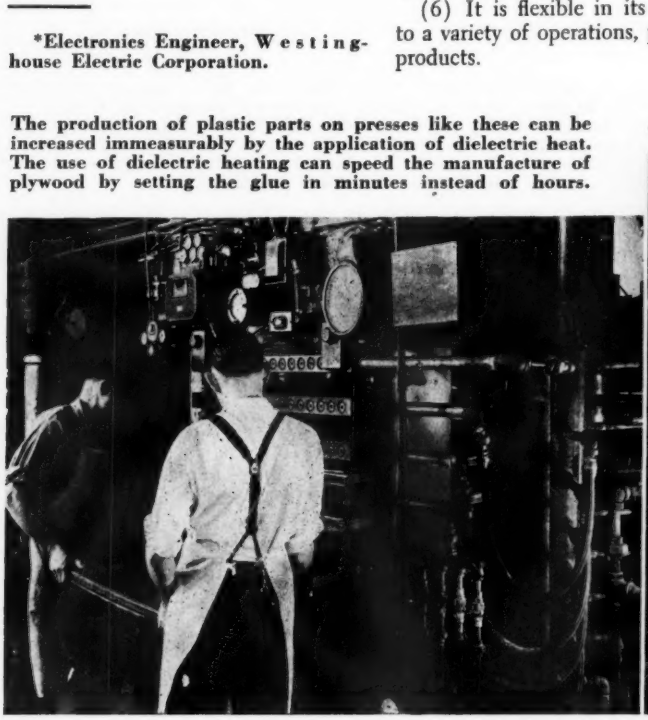
### Dimensions

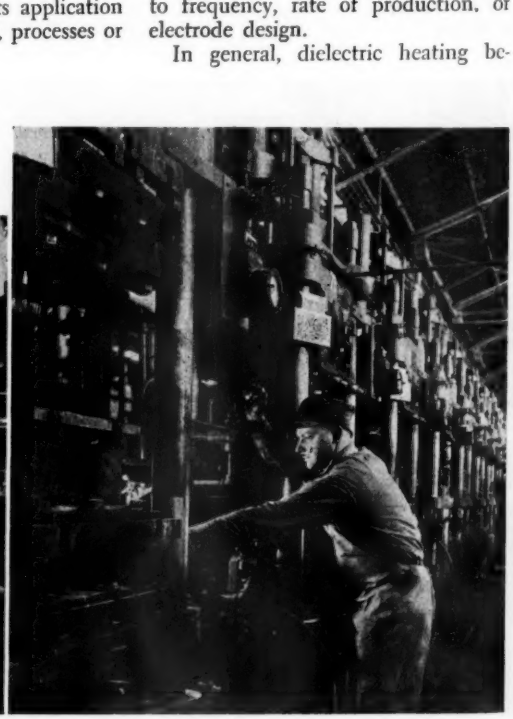
The dimensions of the piece of dielectric material are important in that they may influence an application as to frequency, rate of production, or electrode design.

In general, dielectric heating be-

*Electronics Engineer, Westinghouse Electric Corporation.

**The production of plastic parts on presses like these can be increased immeasurably by the application of dielectric heat. The use of dielectric heating can speed the manufacture of plywood by setting the glue in minutes instead of hours.**





comes attractive when the thickness of the material is sufficient to make it difficult to heat the material throughout by conventional means. In terms of inches, this will vary with the thermal conductivity of the material.

The thickness of the material must be reasonably uniform if uniform heating is desired. If the work is of such shape (for example, wedge shaped), that two pieces of material can be placed in complementary positions and the resultant thickness be uniform, the material will heat evenly. Special technique in electrode design and arrangement may sometimes be used when dealing with irregular thickness materials. The relation of thickness and voltage will be discussed under voltage.

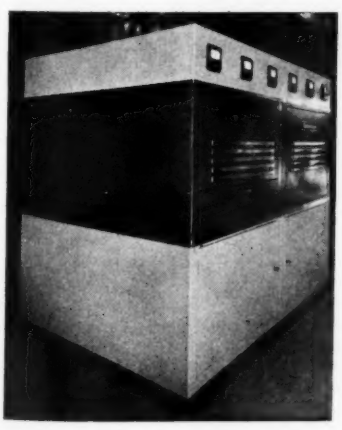
The area of material to be heated will limit the frequency which may be used, in two ways.

The capacitive reactions of a large area may become sufficiently low as to make tuning of the load extremely difficult if not impossible. The currents involved may also reach magnitudes difficult to handle.

The length of the load may be such as to produce standing waves. This will be discussed further under frequency limitations.

Sometimes it is possible to scan the material thus reducing the electrode area to a value which permits convenient adjustments and frequencies sufficiently high to produce desired rate of heating.

Occasional applications are encountered where a particular area can be heated if the material is stacked, increasing the thickness dimension and thereby reducing the capacity of the load.



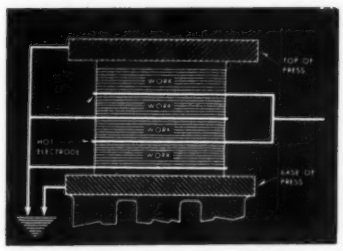
**This compact cabinet contains the oscillating and rectifying equipment needed for dielectric heating.**

### Frequency

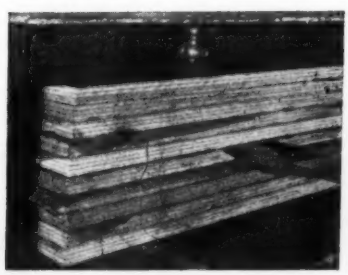
In general (since the amount of energy introduced into the material is proportional to frequency) the desire is to use as high a frequency as possible. A compromise is usually necessary however, due to one or more limitations.

The effect of large areas and low capacitive reactance was discussed previously.

The length of the material may be such as to produce uneven heating due to standing wave effect. The higher the frequency used, the greater the probability of unequal voltage distribution over a given length or area. If the longest dimension of the electrodes is a small fraction of a wave

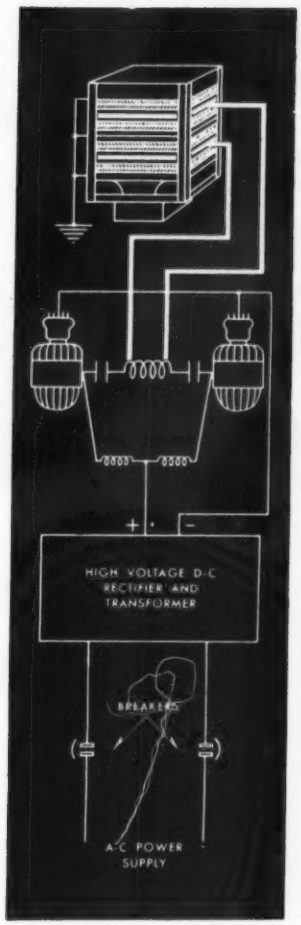



**Dielectric heat can be applied to heating presses by connecting the electrodes in various ways. The "sandwich" method of heating shows how four laminated assemblies can be heated at one time. The top and bottom of the press and the center element are kept at ground potential. Below, plywood stacked in press.**



length, or if the material is scanned, this effect is minimized. Ordinarily if the longest distance from the point of connection to the edge or corner of the high voltage electrode is less than 1/16 of a wave length, very little trouble will be experienced. Heating will be sufficiently uniform to produce a variation of less than 20 per cent over the area involved. In some processes, this may be intolerable, restricting the maximum frequency (or maximum dimensions of the work) to a still lower value.

Another limitation occasionally encountered is that of generator design for high power at high frequencies. From a practical viewpoint, at the moment, it appears undesirable to use frequencies above 20 megacycles when powers above about 20 kilowatts are involved.



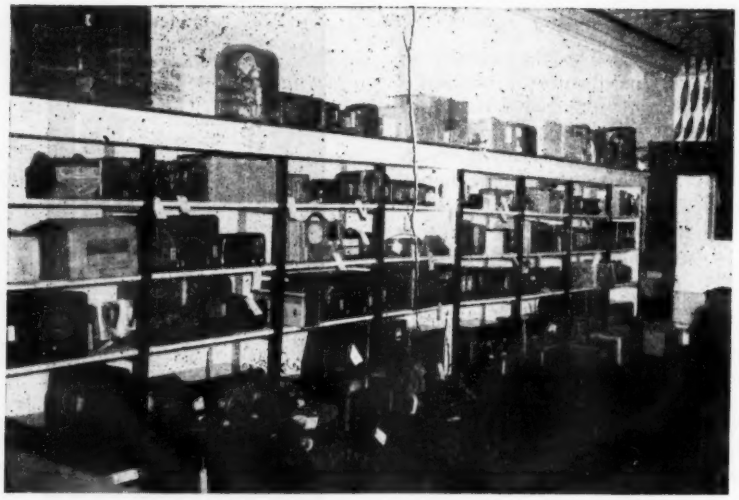

**A schematic sketch showing the power flow for dielectric heating, using Westinghouse Caltronic equipment.**

### Voltage

The power input to the material is proportional to the voltage squared. Hence, if the voltage is increased sufficiently, considerable power can be supplied to the work at relatively low frequencies. Two factors limit the voltage which may be applied.

The total voltage between electrodes should be kept under 15,000 volts. It is not impossible to use voltages above this value, but the additional precautions necessary to avoid corona and arc-overs are often more expensive than some other compromise of

*(Continued on page 80)*



**Reverse English! These sets have been repaired and are awaiting their owners to call for them—most radio shops have stacks like these which have never been touched. Carl Hudgens repaired 2,445 items of electric equipment, mostly radios, by himself in 1944, against an average for one man of about 500 in a national poll.**

# 2000 Radio Service Jobs Yearly One-Man Service Shop Record

HOW MANY radio sets can a one-man radio service repair in one year?

Some one has reported that the national average is around 500 sets but Carl Hudgens, owner of Carl's Radio Service, Sparta, Tenn., repaired 2,445 pieces of electrical equipment for the year 1944.

He has consistently handled an average of 2000 jobs a year for several years. His high volume is partly due to systematic and methodical repair work, knowing his business and keeping everlastingly at it.

At first glance one would not believe that 2,000 radio repair jobs could come from the district around Sparta, Tenn., which is the county seat of White county and has a population of 2,211, but Carl's Radio Service does all the work for an adjoining county, in which there is no radio serviceman.

The shortage of paper radio dials did not bother Mr. Hudgens. When he received a set for which no dial was available and there was a set in the house with a good dial he merely photographed the good one and made an enlargement of the proper size. The negative was filed and similar dials could be made at any time.

Another of his inventions found its way into the radio manuals.

He often found it necessary to introduce a small amount of capacity in a radio set, smaller than available condensers provided and he did it by the simple expedient of taking two leads and winding one about the other for a short distance leaving the ends unconnected.

This often provided the tiny amount to balance out between tube stages and helped make a good circuit more stable. He called this a "gimmick" and its use has now spread until it is found in most radio manuals under the name he gave it.

Mr. Hudgens has been in the radio repair business since the beginning of radio in 1922 and in his present location for ten years.

He has already contracted for a nationally known line of electric appliances which he will merchandise. One of the answers to postwar competition when everyone will be trying to sell refrigerators, electric kitchens and washing machines, according to the ideas of Mr. Hudgens is that the firm which has given good service in the past can be expected to continue to give it in the future.

"Customers are going to become service conscious after the war," Mr. Hudgens said, "and they are going to feel they have made a better buy when they buy from a firm which has an established service department with a reputation.

"For instance during the four years of war when radio sets have been unobtainable, I have kept in service 8,000 radio sets. Radio buyers in my store, as well as refrigerator and electric stove buyers, are going to come from this 8,000 block of service customers that I already have, and from their friends who have spread the gospel by word of mouth.

"I'll have chain store competition here from the big chains as well as the metropolitan dealer," Mr. Hud-

**Mr. Hudgens solved the problem of the shortage of paper radio dials by photographing a good one and making an enlargement of the proper size.**

**Carl Hudgens, owner of Carl's Radio Service, Sparta, Tenn., with a "gimmick" in his hand. Carl gave the name to his method of introducing a very small capacity in a circuit and later found it appearing in the manuals.**

gens continued. "And the fly in the ointment of the chain dealer is that he has never been able to give good service and get close to the customer. I expect to see a few of my customers buy cheap $79.50 refrigerators. They may buy two of them before they come in and pay $250 for a real job which is big enough and built for ten years service.

"Naturally competition between dealers handling standard brands of quality products will be different than the competition between the nationally known brand and the private brand. With nationally known brands the competition between dealers may result in the dealer equipped to give the best service getting the business because every farmer knows that no equipment is much better than the service behind it.

"My service will be rendered on the job. Many others will have to send the unit to some central location for repair. The customer will do without until it has been returned. This is the way the chain repair service will be handled and consequently the dealer who can drive up to the customer's house in his own truck and give immediate service in his own shop is going to get his share of the available business."

**Drilling vase bottoms for lamp bases. Slow speed drill and plenty of turpentine is the secret of drilling glass and pottery. Turpentine should be constantly flooded around the drill. Keep drill cool.**

# Outlets for Inadequately Wired Homes Promoted Successfully in Kansas

INADEQUATE wiring in homes is keeping the two members of the C. & H. Electric Company, 2546 Jackson street, Kansas City, Mo., busy changing fixtures, replacing old style fixtures with fluorescent, and adding extra receptacles in walls and floors.

A flat rate of $5.00 for each wall plug is charged unless the customer prefers to have the work done on a time basis. For the flat rate charge they install a heavy duplex receptacle and run up to ten feet of No. 12 wire. Over ten feet is done on a time basis. Time basis work is charged for at $2.25 per hour plus material.

"There are few houses more than five years old which do not need from one to ten extra receptacles," Bob Craig, a partner, said. "Many calls come in to install one and before we leave, we often manage to sell five or more."

Most of the branch lines on the old residences in Kansas City are overloaded as appliance after appliance has been added. They have many jobs of adding new branches or increasing the load carrying capacity by installing new wiring.

**Left to right: Bob Willis and Bob Craig, owners of the C. & H. Electric Company, Kansas City, Missouri, newly organized firm which is specializing in home electric maintenance.**

There is a heavy demand in Kansas City for plastic wall switch frames which prevent the walls around switches from becoming soiled.

All the older houses have push-type switches and the owners want the newer flip switches in volume plus the plastic wall frame. Changing these switches in volume makes a lucrative item for any electrician.

C. & H. Electric Company also found there was a good demand for changing the existing fixtures to fluorescent, particularly in old style bathrooms and in halls.

The way it has worked out is that when the home owners found out there was a firm specializing in this type of work they flooded them with calls. The reason is that firms specializing in contract work, mostly new construction, are unable to get enough help to run their own jobs and can't handle these small jobs profitably, or at all.

Specializing in this work gives the C. & H., which is a new firm, volume enough to route the work and when the day is added up it makes a profitable volume.

Another item that has been coming in is the business of wiring kerosene lamps and wine jugs into table lamps A popular item is two wine jugs which are sold by Missouri pottery works. Many of these have been sent

*(Continued on page 79)*

# PROFITABLE ANTENNA BUSINESS RETURNS WITH TELEVISION AND FM RADIO

TELEVISION and frequency modulation radio will bring about a return of the profitable antenna business which characterized the early days of radio, in the opinion of W. M. Dickson, owner of the Dickson Radio Service, Kansas City, Kan.

Construction of precision-built antennas will probably run between $25 and $50 in cost, Mr. Dickson said, and probably every owner of an FM set and every owner of a television set, will want the best to be had in antennas, installed by competent radio men who are equipped for building antennas that will get the best of reception.

In the old days of radio, two masts, 100 feet of aerial wire, two insulators, and some insulated fixture wire for a lead-in, sold for from $5 to $25. It degenerated into a wire strung any way between two points, eventually connecting with the set.

When the neutrodynes gave way to the more sensitive super-heterodynes and almost any set could operate on a short piece of wire inside the room, the antenna building business as a part of a radio or electric store service, passed out of the picture.

**W. M. Dickson, owner of Dickson Radio Service, stands beside his well equipped radio test panel.**

**Exterior Dickson Radio Service, Kansas City, Kansas.**

FM radio sets will need an antenna built for it in order to obtain best results and only those located in the immediate vicinity of an FM transmitting station will be able to operate with makeshift antenna equipment. Television will be even more temperamental in regard to antenna equipment.

Wise radio men planning on entering this business will study proper aerial installations, where they will find sale for ready-made antennas, coaxial cable, balancing-out transformers, and what not.

Mr. Dickson, having had experience with RCA in New York, in FM and television, opened his radio service shop last September and has equipped it to handle all kinds of circuits but particularly for FM and television.

For instance, an oscillograph occupies a place on his test panel. This is used for testing the discriminator circuit in an FM radio, which roughly is a circuit that displaces the conventional grid-biased detector circuit by using a circuit based on phase relationship. Testing of this important part of the circuit consists of phase balancing or canceling which is only possible by visual observation in an oscillograph.

Another instrument which he is using is the traceometer, which allows the service man to trace the carrier wave through the circuit by reading the movements of the meters, at least up to the discriminator circuit.

Up to the present time, a competent radio service man could make most repairs with a 1000-ohms per volt voltmeter, although tube testers and commercial analyzers would be helpful.

FM and television will make more accurate tube testers a necessity and render the voltmeter almost obsolete in that category. The importance of the vacuum tube voltmeter will be greatly increased.

There are two FM stations in Kansas City, KOZY and KMBC, and a considerable number of sets. It is expected that because FM radios need to be near stations, that Kansas City will be one of the places where a brisk demand for FM sets will be experienced.

With this in mind, Mr. Dickson opened his shop and completed the

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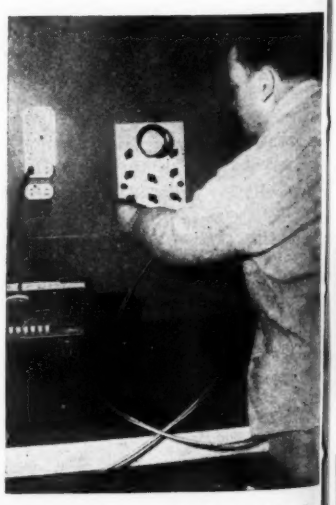


**An important part of his test equipment is the oscillograph shown here. It will be essential for FM radio testing and servicing.**

# For HOT SPOTS use "Neasbestus" WIRES and CABLES

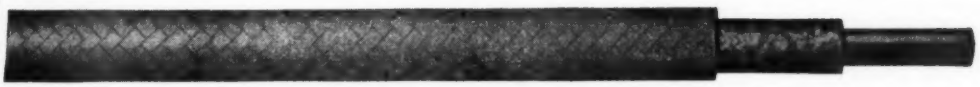
A name to remember for installations where heat, flame, oil, moisture, grease and corrosive fumes prevail, and where rubber, Neon (thermoplastic) and varnished cambric insulations are unsuitable.

Illustrated are two examples from our wide range of asbestos and asbestos-varnished cambric insulated wires and cables. Literature and complete engineering data on request.

NATIONAL ELECTRIC PRODUCTS
NE
WIRING SYSTEMS
WIRES AND CABLES

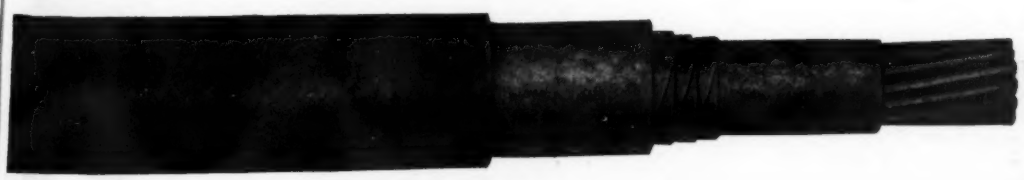
## ALL ASBESTOS WIRE AND CABLE

Sizes No. 18AWG to 1,000,000 CM.—For wiring rheostats, stoves, switchboards and electrical equipment exposed to heat or fire hazard. Also for general open wiring in hot locations. 300 and 600 volt ratings. Max. operating temperatures 200°C (392°F) and 125°C (257°F) respectively.

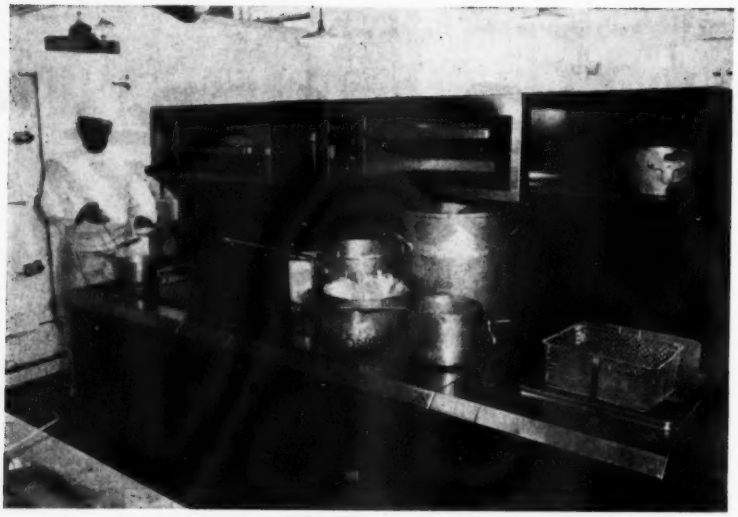


## ASBESTOS-VARNISHED CAMBRIC CABLE

Sizes No. 18AWG to 1,000,000 CM.—For power circuits and general hot spot wiring in boiler rooms, steam tunnels, etc. 600 to 8000 volt ratings. Max. operating temperatures 110°C (230°F) and 91°C (196°F) respectively.



National Electric
PRODUCTS CORPORATION
Pittsburgh, Pa.



**The all-electric equipment in kitchen of the Ardmore Hotel, Ardmore, Okla., includes ranges, broilers, roasting and bake ovens, refrigerators, electric dishwashers, mixers, waffle irons, roll warmers, egg boilers, fry kettle, etc. The island arrangement of the ranges shown at the left contributes to convenience and sanitation.**

# All-Electric Kitchen for Hotel Pays for Itself in Savings

INCREASED patronage and more rapid handling of customers at peak hours are among favorable results accomplished from recent electrification of the kitchen and coffee shop of the Ardmore Hotel, Ardmore, Oklahoma.

Other advantages of the all-electric installation, include speedier and smoother operation in preparation of food, substantial savings in labor costs and turnover, better cooked and tastier foods, and the favorable attention that a thoroughly modernized eating place naturally attracts.

Patrons and employees find themselves in cooler and more sanitary surroundings with complete absence of offensive odors from the kitchen. Hotel management notices reduction of waste of foods and materials, less cleaning and redecorations, and a better satisfied clientele.

More efficient food preparation by electrical processes has reduced the amount of garbage from three barrels to less than one barrel per day, has stopped accidental dumping of silverware into the garbage, reduced breakage of glassware and dishes, and accomplished a much greater degree of sanitation. The management estimates that use of a Salvajor for prewashing the dishes has saved the hotel $100 a month by recovering silverware left on plates or in crockery. Otherwise, most of this would have gone to garbage cans and dumps.

The Oklahoma Gas and Electric Co., of Oklahoma City, which distributes electricity in about 240 Oklahoma communities, is cooperating with electrical contractors and dealers in spreading the idea of all-electric kitchens throughout the state. Several hotel and restaurant kitchens and dining rooms have been converted to all-electric operation within the past two years.

Although the O. G. & E. Co., along with other public utilities in the state, are barred by a state law from selling appliances and equipment, it maintains a live commercial sales department, which furnishes free engineering and sales advice to assist electrical contractors and supply houses in selling and installing electrical equipment and appliances.

One of the more recent and outstanding selling jobs of that kind was made to the Ardmore Hotel management through active cooperation of B. C. Spencer, of the headquarters O. G. & E. office, with company representatives in Ardmore and such firms as the General Electric Supply Corporation and the Franklin Kane Company, both of Oklahoma City, and Cecil Baber, Ardmore, electrical contractor. The 27-year-old gas kitchen equipment had become inefficient and the board of directors was considering general plans for modernization.

Through an appearance before the board and a string of correspondence and demonstrations, the management was sold on the modern idea of all-electric kitchen operation. The utility and equipment experts aided the hotel in securing priorities and in finding war-scarce materials, and shortly after the first of this year the electrical installations were started. The remodeling job was completed by early spring.

Operations since then have demon-

**This two-decked combination baking and roasting oven is conveniently near a mixer, meat slicer, and a baking cook's refrigerator.**

*"One of a Series Interpreting Hotpoint's Promise to the Public: Dependability Assured by 40 Years Experience"*

# Hotpoint And The Complete Electric Kitchen

HOW effective Hotpoint's outstanding merchandising idea—the Complete Electric Kitchen—has proved with the public is confirmed by recent surveys.

●● *In calling on over four thousand urban homes in all income brackets, the Curtis Publishing Company found that the first post-war desire of home owners, next to painting and decorating, was for the remodeling of kitchens.*

●● Hotpoint's own experience demonstrates that the Complete Electric Kitchen is a natural for "Ensemble Selling." Coupon returns for kitchen planning indicate a tremendous interest on the part of both men and women. Hotpoint's personalized Kitchen Planning Service gives reality to kitchen dreams. And the Hotpoint plan permits dealers to make individual appliance sales while turning buyers into continuing customers.

●● Naturally, a complete line of related appliances is necessary to enjoy the many benefits of the Electric Kitchen Merchandising Plan. And today as for many years past, Hotpoint is one of the few complete and nationally advertised lines available to the American public.

●● *Forty years of housekeeping experience in millions of American homes make Hotpoint the thoughtful homemaker's choice.*

★ ★ ★

Edison General Electric Appliance Co., Inc., 5614 W. Taylor St., Chicago 44, Ill.

DEPENDABILITY ASSURED
Home
Hotpoint
Appliances
BY 40 YEARS EXPERIENCE

**This switchboard built up of safety type enclosed switches handles the 100 kilowatt load of Ardmore Hotel.**

strated the wisdom of the management in making the changes, if only monetary advantages were taken into consideration. In addition to speedier, cleaner and more efficient operation, however, the heavier load has accomplished a reduction in power cost for general operation of the hotel, from 1.98 to 1.45 cents per kilowatt-hour.

One of the first problems was to find enough wire, conduit, and switches in Ardmore and Oklahoma City at the time for making the 100 kilowatt capacity installation. Materials and equipment which had to be installed by the electrical contractor included a modern electrical switchboard with 22 switches connected to 350 feet of 500,000 circular mil rubber covered cable and 100 feet of 3½-inch conduit. The switches and other wiring equipment were finally located. Sufficient wire and duct also was found and installed to carry the load of a 50-ton air conditioning unit which will be installed as soon as it is available.

As a visitor enters the shining new kitchen from the coffee shop, he first passes through a modern pantry, complete with a refrigerated salad section equipped with electric grills, waffle irons and toasters, a mixer, pie compartment, and a polished steel salad table.

An all-steel plate warming and service table stands in a convenient location in front of two huge, thermostatically-controlled ranges, assembled en-bank, and provided with broilers. A two-deck combination roasting and baking oven stands nearby. The ranges are placed on a slightly raised platform in the center of the kitchen for more efficient operation.

Also prominent in the department is a two-deck, cooker in which vegetables are cooked under steam pressure, saving all vitamins and minerals.

Three big electric reach-in refrigerators were installed, two of 45 cu. ft. capacity and one of 85 cu. ft. An ice cream cabinet also is included in refrigeration equipment.

An electric dishwasher which passes the dishes through sterilized water at 180 degrees F. speeds operation, reduces breakage and increases sanitation. Other kitchen equipment includes a slicer, two waffle bakers, a two-drawer roll warmer, an egg boiler, and a fry kettle.

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## Contractor's Opportunity In Electronics Field

**By Jack Fagile***

WE ALL KNOW that electronics is one of the future great industries. Contractor personnel should be fully equipped to take over sales and service of electronic equipment as soon as it is released for the civilian consumer.

If he is not equipped, most of the maintenance and many of the sales will go into the hands of inexperienced servicemen. The result will be a setback to the electronic industry as a whole. If proper service cannot be obtained, sales, quite naturally, will decline. The situation will give the manufacturer a black eye and cause general dissatisfaction.

An electric company should be a service organization in every sense of the word, and should be fully prepared, both with equipment and trained men, before venturing into any field.

I have, in addition to a master electrician's license issued by the City of San Antonio, a first class radiotelephony operator's license, and have been in the electrical and some phases of the electronic business for a number of years.

With this experience behind me, I feel I may speak with authority in the following statement:

If the electrical contractors cannot supply competent men to install and maintain electronic equipment, they may find themselves in competition with a group under no municipal control and the industry will be exploited. The contractor who is not preparing for electronics is overlooking one of the largest phases of his future work.

I conduct a class in electronics for my staff of electricians one evening each week from seven-thirty to ten-thirty. At the present time, we meet in the stockroom where we have a large blackboard.

Our present subjects are merely foundation materials, such as electronic theory along with the actual construction of simple electronic devices to establish the theory clearly in their minds. When this is completed to our satisfaction, we plan to carry on with an especially designed course in elec-

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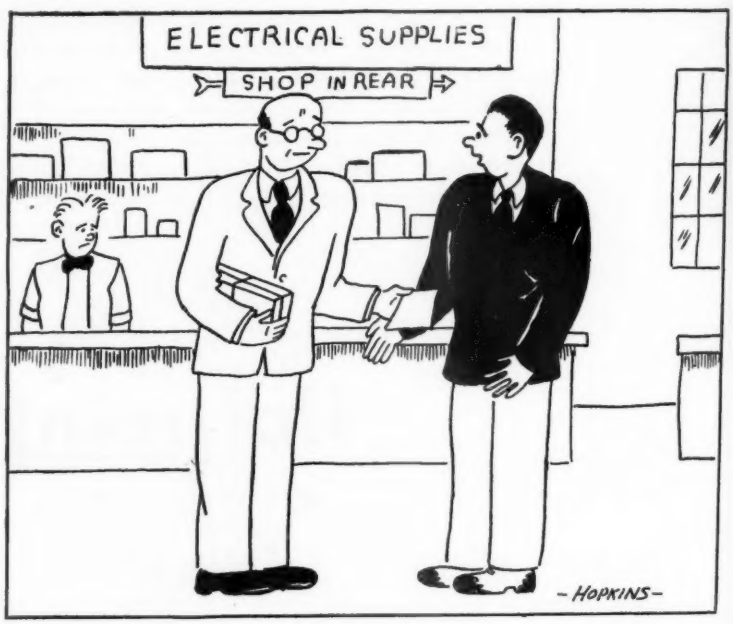
***Mr. Fagile operates the Guarantee Electric Co., of San Antonio, Texas.**




**"Jones, here's your release and a box of flashlight batteries. You go to work for Fleming Electric tomorrow—I lost you both in a V-E Day bet!"**

*Panel Boards* For Lighting and Power
Distribution Panels ★ Switchboards

*Weatherproof* Meter Enclosures for Type A Meters
and Polyphase Meters

*Meter Troughs* For Socket Type Meters

*Transformer Cabinets* For Indoor and Outdoor Installation

*Weatherproof* Service Entrance Switches and Panels

*Combinations*: Meter Enclosures and Service Entrance Equipment
Meter Troughs and Service Entrance Equipment

*Combination*: Floor Boxes and Pedestals

• • Switch and
Starter Pedestals
• Weatherproof
Junction Boxes

*Hinged Cover* and Screw
Cover Steel Boxes

*Switchboard* Cubicals Made
to Customers Specifications

# A BLUEPRINT
*of things to come*

WALKER ELECTRICAL
*Company* WECO ATLANTA *Atlanta*

MANUFACTURERS OF SWITCHBOARDS • PANEL BOARDS • SERVICE EQUIPMENT • METAL ENCLOSURES

A BIGEST OF SUCCESSFUL SELLING IDEAS

# THE SELLING PARADE

(REGISTERED)

BY CHARLES B. ROTH

## ON BEING CLEVER

Her name was Madame Recamier and she had lost a husband and a fortune in the French Revolution, and lived frugally in a four-room flat in Paris. Yet no woman, no matter how great or rich, has ever exerted such influence on her times as Madame Recamier.

The great of Europe sought her modest home, there to be charmed by the winsomeness and the skill of this woman, of whom scores of articles and half a dozen books have been written.

It seems to me that any salesman could take one tip from Madame Recamier, and thereby become a greater salseman. The thing he could learn from her is that it is always better to make the prospect seem clever than to be clever yourself.

In Madame Recamier's company, men and women found themselves saying very clever, witty, wise things. That pleased them. They didn't reflect why they were so clever, witty, wise with her, being too pleased with themselves.

But careful students of the Recamier technique have revealed that this quiet, gentle woman never made a clever remark herself, but always said something which made the other person respond cleverly.

Do you get the idea?

See how it applies to your job.

Many salesmen, thinking to entertain and hence please their prospects, have the habit of telling stories or making wisecracks. Sometimes the prospect has been pleased. Sometimes he has been bored.

It would be better to say something which lets the prospect say something clever. That is what Madame Recamier would have done.

It takes a little thinking to understand this technique and quite a bit of courage to practice it, but if you can build up your prospects, you can sell more than you ever sold before.

## ONE THING YOU NEED

Put it down as an incontrovertible fact that if you want to make progress in the postwar world, one thing you simply must have, and cannot get along without, is a state of mind known as **infinite flexibility.**

This is the obverse of the state of mind known as the **static outlook.**

I think it isn't necessary for me to belabor the two phrases and explain them. This only let me say: Infinite flexibility is the mind of a man or woman which is flexible and can change to suit conditions, while the static outlook is as fixed as granite.

The reason I say you must have infinite flexibility is that the postwar era, if it brings nothing else, will bring change. Old ways will be out. New ways will be demanded. On everything.

Those who can change can survive, but victims of static thinking will be like the dinosaur, unable to change, hence unable to exist.

When changes come to you in your life or your work, note carefully how you react to them. If you long for the "good old days" or say, "This is the way we used to do it," you are in danger. The static outlook has gripped you.

But if you welcome change and look on every new development as a new adventure, you are safe: you have **infinite flexibility.**

## EX-SERVICE MEN CAN SELL

A few months ago I helped conduct a sales clinic for a group of sales managers in the Midwest. In the question period, several of them wondered if ex-service men would make good salesmen or if their military training had "done something to them" to prevent them from fitting in with the demands of business.

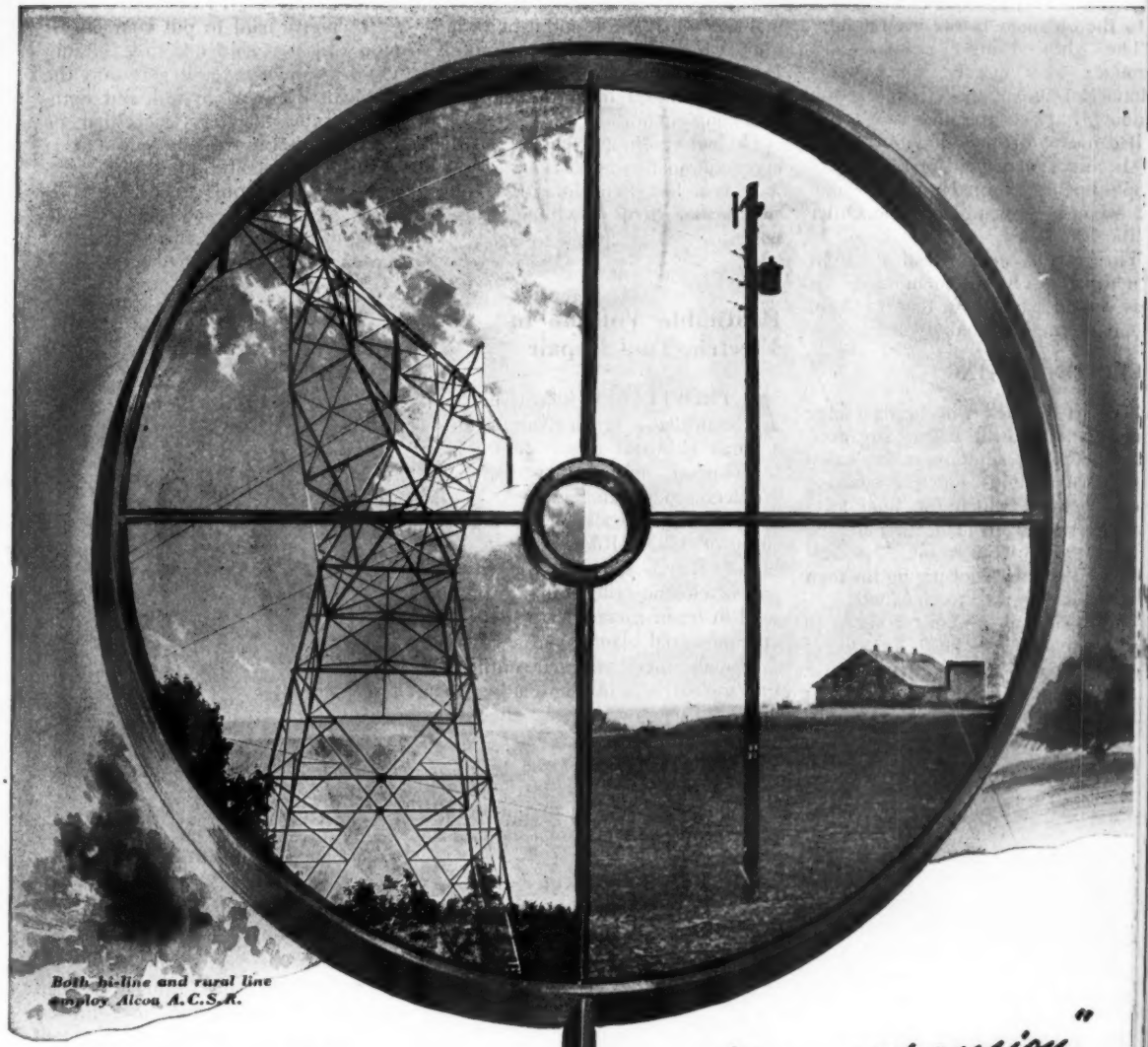
My answer was that of course ex-service men will make good salesmen. An ex-service man, once he gets the "feel" of civilian life again, is the same as any other civilian.

Which reminds me of the story that I consider the best salesmanship story ever written. Its author is Peter B. Kyne and it was published shortly after World War I with the title "The Blue Vase," changed later to "The Go-Getter."

Comrade Bill Peck, one-armed, big, ugly Bill Peck applies for a job to Cappy Ricks, shipping-lumber magnate of the Pacific Coast. Ricks' stuffy son-in-law, Matt Peasley, with the idea about ex-service men that too many other executives seem to be acquiring, turns up his nose at the crippled veteran, decides to make it as tough as possible for him.

Comrade Peck, given the dirtiest selling jobs around the shop, comes through beautifully. He outsells the record of anyone the Ricks interests ever had. Then Ricks, thinking to test him for promotion, gives him the test of the blue vase.

This is a mythical valuable vase which Ricks simply must have. It's on a Sunday. The vase is in a pawnshop downtown in San Francisco. Will Comrade Peck get it and deliver



*Both bi-line and rural line employ Alcoa A.C.S.R.*

## UNCLE SAM SAYS:

## "Set your sights on postwar expansion"

**The government already is urging line operators to shift from wartime construction methods . . . because materials for sturdy, long-life operation are now in sight.**

**The new postwar standards, allowing for increasing loads during the era ahead, particularly for rural lines, should be more rigid than prewar standards. This means more work for A.C.S.R. (Aluminum Cable Steel Reinforced) which, for low initial cost, and with low maintenance expense, provides for these increasing loads.**

**Ask an Alcoa engineer to show you the plain facts of A.C.S.R. load capacity, long life and operating economy . . . based on the experience of more than a million miles of lines.**

**ALUMINUM COMPANY OF AMERICA, 2164 Gulf Building, Pittsburgh 19, Pennsylvania.**

# ALCOA A-C-S-R

to the old man before evening?
The whole thing's a hoax, and
omrade Peck sweats, suffers, gets
letracked, finally has to break the
ndow, but gets the blue vase.
Because of his devotion to a trust,
becomes manager for the Ricks
ople in the Orient. He makes good.
e becomes a member of the Order
the Blue Vase.
This is the story. Read it. It is
nething every salesman and his
ss should have, now that we have
service men around us again.

## EEP ON ASKING

Gaylord B. Buck, who heads a large
d very successful selling organiza-
n out West, admonishes his sales-
n at his famous Tuesday morning
es meetings, which the men love,
it most sales are made because the
spect is too weak to say, "No."
Which is his way of urging his men
ask, ask, ask, ask for business.
'You can't ask a man too often to
y," he puts it. "What if you do get
own down oftener when you ask
m when you don't? It doesn't hurt
get turned down, does it? I've been
ned down thousands of times and
k at me now, fat and sassy and full
pep.
'It costs nothing in either time
effort to at least keep asking for
siness. The assumption that nobody
nts to buy is fatal. Keep asking for
siness, and when you are turned
wn, ask one more just for fun."
No one ever said anything truer
out selling than this man in ex-
ining his selling doctrine.

## OW FAR YOU'LL GO

Maybe you remember years ago of
ding Cervantes' famous novel Don
ixote, and recollect that the Don,
over-age, skinny, slightly cracked
lividual, had great hallucinations.
was a great knight—in his own
nd—going about the country, free-
enslaved maidens and standing
for the oppressed.
What if his charger was a decrepit
crowbait, ready for the boneheap?
served Don Quixote in winning
at bouts of arms. What if his re-
ier, fat, stupid Sancho Panza, was
t a dolt riding on an ass? No pan-
ied warrior ever went forth to bat-
with higher spirits or a more reste
mind.
Look on Don Quixote as a "screw-
l" if you like, but Tom Dreier, in-
esting writer of little business mag-
nes, says that from him all sales-
n can learn. He says that the Don
nd what he wanted to find wher-
r he was. He was looking for hon-
orable conflict, and found it in a wind-
mill, which he attacked vigorously.
He was looking for romantic adven-
ture, and found it in the most dis-
couraging circumstances.
He had vision, and Dreier says that
every salesman needs vision.
It is a fact that none of us goes
any farther than our thoughts carry
us.

It's pretty hard to put your fingers
on a subject as elusive as this, the sub-
ject of thoughts, for it gets into the
realm of the metaphysical. But noth-
ing is truer than this fact, that no
salesman ever went one yard farther
than he thought he could go.
So, in the words of Elbert Hub-
bard, "Aim high and believe your-
self capable of great things."

---

## Profitable Volume in Electric Tool Repair

A PROFITABLE industrial repair item that is proving successful for a small electrical repair shop is the servicing of motor operated drills, grinders, sanders and saws.

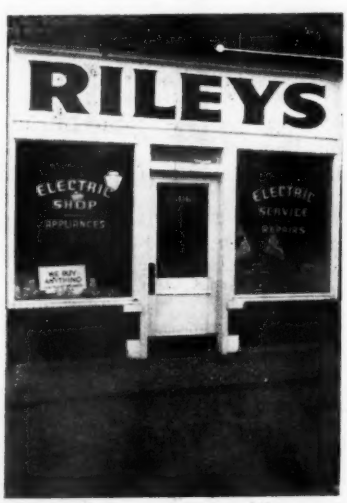
The business backbone of the new shop of Gene Riley, 2506½ 15th Street, Kansas City, Mo., is the repair of electric drills and similar tools used in repair garages, carpenter shops and industrial plants.

Usually they are used until they quit operating and then rather than attempt their own repair, the owner often returns it to the jobber, who in turn sends it to the manufacturer. Since this takes much too long now, the jobber welcomed an opportunity to turn this work over to a shop which would agree to handle it.

Mr. Riley supplemented this work with the solicitation of such work from other concerns and now finds his shop, which was opened February 1, filled with work.

The things that go wrong with electric drills and similar hard-worked tools are bearings and switches. Most of the bearings are ball-bearings and are available. Switches are also obtainable.

**Gene Riley, owner of Riley's Electric Shop, Kansas City, Mo., at his work bench, repairing an electric sanding machine.**




**Exterior of Riley's Electric Shop.**

About the worst thing that can happen to such a tool is a broken casting and this would take the tool out of circulation for a while.

As every repairman knows, repair of electric appliances that are used to produce revenue, rather than as a luxury in the home, always offer little resistance to the price of the best job that can be done.

A mechanic using an electric drill in hard service and who continually is having switch trouble, will buy a heavy duty switch replacement at the first opportunity, where a housewife in a similar situation on a vacuum sweeper could probably never be persuaded the new switch was worth a dollar more.

Industrial repairing has many advantages over the average run of domestic work, Mr. Riley thinks, and while he is accepting such work, at the same time he is surveying the opportunities present to do maintenance and repair work on the appliances used in the hundreds of small shops and factories in his vicinity.

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*.. in meeting INDUSTRY'S needs!*

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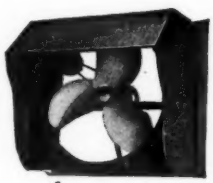
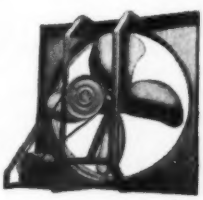
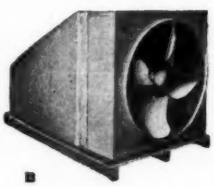


A



C



B

D

CHELSEA

CHELSEA PRODUCTS

INCORPORATED

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IRVINGTON, NEW JERSEY

(A)—TYPE AP
APARTMENT WINDOW VENTILATING FAN
(B)—TYPE EU
PACKAGE ATTIC FAN UNIT

(C)—TYPE ED
GENERAL PURPOSE ATTIC FAN
(D)—TYPE BB
ALL-PURPOSE INDUSTRIAL FAN

# Wave Windings for A-C Motors

## *Chapter 2—Basic Features of Wave Windings, Classifications, and Definition of Terms Used.*

By A. C. Roe*

**This is a continuation of the series of articles, which started in the June 1945 issue of Electrical South, covering a complete study of a-c wave windings. This series will include a complete set of connecting diagrams developed on a new, simplified basis which eliminates the use of the large detailed drawings heretofore associated with wave windings. New subscribers can obtain copies of the first article by writing to the editor of this publication.**

CONTINUING the discussion of wave winding fundamentals begun in the first chapter, this chapter will describe how the a-c wave windings are constructed, and identified, and will define some of the constructional rules. In this series, rotors with 120 degree lead spacings will be used as the basis for study and discussion as in the past the majority of a-c wave windings were used on rotors. However, the diagrams and tables can be used just as readily for stator windings. Only 3 phase windings will be discussed.

### Identifying A-C Wave Windings

All three phase a-c wave windings are divided into six sections, there being two sections per phase. This means that only 12 leads are brought out of the winding, regardless of the number of poles.

Fig. 1 of the preceding chapter showed this feature. The A1-R1-A2-R2 leads indicated that there are four leads from each phase. In a series star connected wave winding, three leads, one from each phase, are connected to the collector rings, three leads, one from each phase, are connected to the star ring, and the remaining six leads, two from each phase, are connected together to form a reversing jumper. Thus R1 and R2 would be connected together, likewise R3 to R4, and R5 to R6.

Another distinguishing feature of a wave winding is that the top front lead bends away from the center of the coil as shown in Figs. 5 and 6 or in the same manner as a d-c wave winding coil lead. Other data presented in this series will enable the reader to classify the winding as to slots-per-pole-per-phase, number of poles, right hand, leads on top, etc.

### "Hand" of Winding

The hand of the winding as "left hand" or "right hand" is fixed mechanically by the type of coil employed, and the two terms in common use will be defined as they divide the four possible winding classifications into two groups as will be discussed later.

"Left hand coil" or winding as shown in Fig. 5 can be defined as follows: with observer facing the lead end of the winding, if the top half of the coil, G, is nearest the air gap on the left, the coil is left hand. Fig. 5 shows the top front half on the left, that is, the shaded area is the top coil half. Note how the top lead bends away from the center line of the coil as at A to G, Figs. 5 and 6.

"Right hand coil" or winding as shown in Fig. 6 has the top coil half G on the observer's right, when observer is facing lead end of winding.

The hand of the coil in any winding can be determined by a glance at the top surface of any rotor or stator winding. With the observer facing the

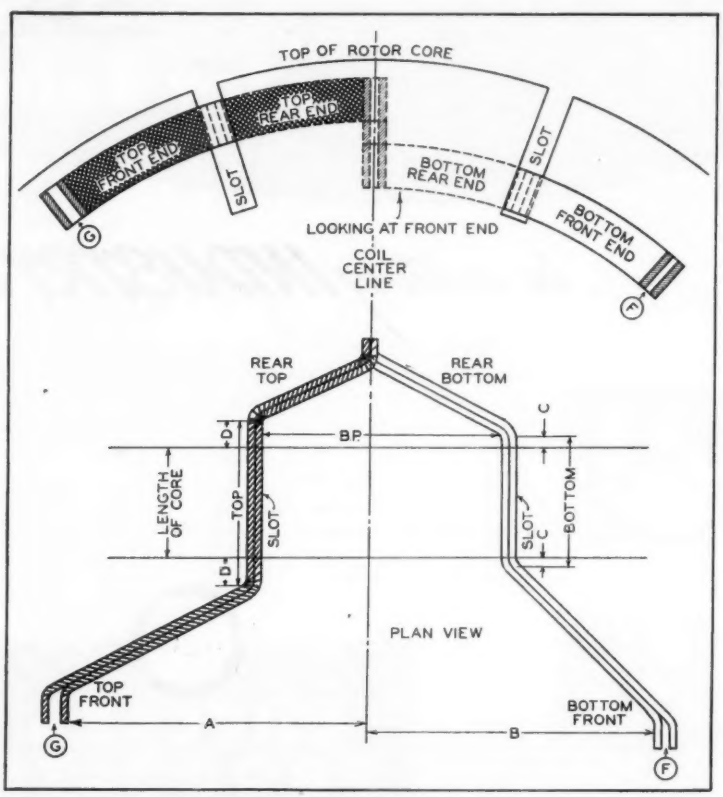


**Fig. 5. These drawings show side view and plan view of a "left hand" rotor coil for a-c wave wound rotors. With coil in position in rotor slots, the top half of the coil is on the left side, with the observer facing the lead end of the winding. The coil shown here has 4 conductors per slot.**

*Mr. Roe is a motor engineer associated with Westinghouse Electric Corp., East Pittsburg, Pa.

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WIRE WITH WALKER

**Complete resistance to moisture, in all its forms, is afforded by the thermo-plastic insulation used on Walker TW Small Diameter Building Wire. Thus it is ideal for applications where there are wet soils, damp walls and floors, and surface raceways where wires are exposed to vapors and condensation.**

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**Existing raceways can be easily rewired with Walker's TW. Its slick, smooth surface permits easy pulling, and its toughness withstands bending around corners. Stripping and splicing can be done quickly and with ease.**

**Walker's TW is supplied in standard colors, and in sizes from 18 to 4/0. Ask your Walker Distributor for prices and delivery information, or write to WALKER BROS., Conshohocken, Pa.**

**WALKER'S TW is approved by the Underwriters' Laboratories (1940 Code, Section 3035) in sizes from 14 to 4/0 inclusive for use in raceway systems, such as (1) Underground, (2) In concrete slabs or masonry in direct contact with the earth, (3) In wet locations, (4) Where the condensation and accumulation of moisture within the raceway is likely to occur.**

**While the use of T or TW in new construction is now permitted under emergency regulations, the proposed new N. E. Code will recognize its universal use.**

* The Underwriters' Laboratories, Inc., have adopted the term "Thermo plastic" for "Synthetic" insulated wire and have substituted the type letters T and TW for the old types of SN and SNW.

WALKER BROS. Conshohocken

lead or collector ring end, in the case of *left* hand coils, the rear coil ends bend away from the center line of the coil to the *left*, and also the top coil halves front and rear are both on the *left* hand side of the center line. In the case of *right* hand coils, these distinguishing features are on the *right*. Thus Fig. 5 of this chapter and Fig. 1 of chapter 1 can both be identified as *left* hand.

**Location of Leads on Coils**

With twelve leads for any a-c wave winding there will be six top leads and six bottom leads. The latter will have to be connected after the other coils are "clipped" or "stubbed up." It has become standard practice to classify only the coil ends that connect to the star ring and collector rings as "leads." Thus only the coil ends used for A1, A2; B1, B2; C1, C2 are classed as leads and this designation will be used throughout this series.

It will be found that if the bottom coil ends should be used for leads, that all A1, A2, etc., leads will be on the bottom.

"Leads on bottom" means that the A1-B1-C1 and A2-B2-C2 leads are brought out from the bottom front coil ends as shown in section B, Figs. 5 and 6.

"Leads on top" indicates that the A1-B1-C1 and A2-B2-C2 leads are brought out of the windings on the top coil halves, or as shown in sections A, Figs. 5 and 6.

**Hand and Lead Classification**

From the preceding definitions, we find that the a-c wave windings can be divided into four groups according to coil hand, and whether leads are on top or bottom:

*Left Hand, Leads on Bottom* indicates a winding using left hand coils as shown in Fig. 5, where the A1-B1-C1-A2-B2-C2 leads are all attached to the bottom leads of coils, such as F in Fig. 5, in the proper slots.

*Left Hand, Leads on Top* indicates a winding using left hand coils as shown in Fig. 5, where the A1-B1-C1-A2-B2-C2 leads are all attached to the top leads of coils, such as G in Fig. 5, in the proper slots.

*Right Hand, Leads on Bottom* indicates a winding using right hand coils as shown in Fig. 6, where the A1-B1-C1-A2-B2-C2 leads are all attached to the bottom leads of coils, such as F in Fig. 6, in the proper slots.

*Right Hand, Leads on Top* indicates a winding using right hand coils as shown in Fig 6, where the A1-B1-C1-A2-B2-C2 leads are all attached to the top leads of coils, such as G in Fig. 6, in the proper slots.

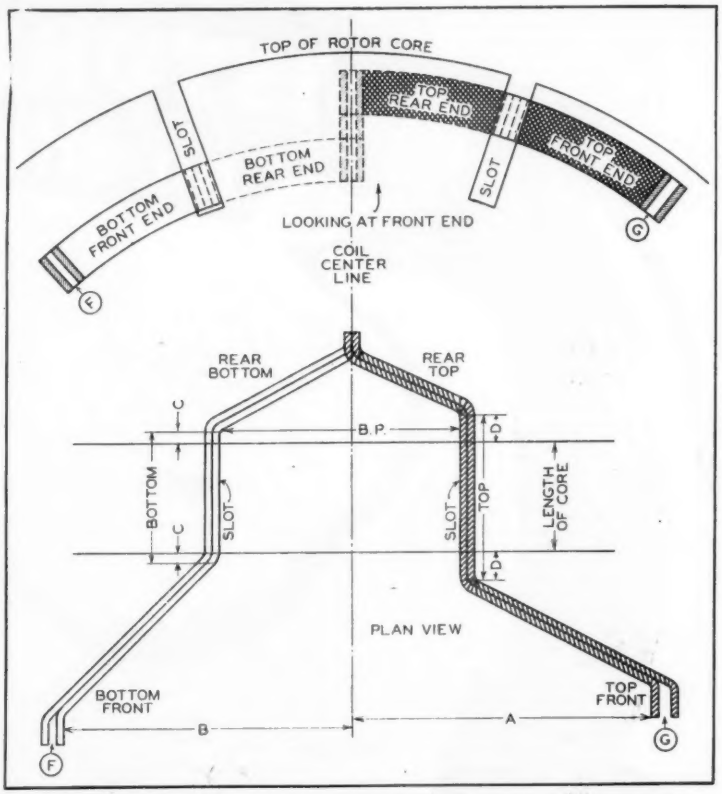


**Fig. 6. These drawings show side view and plan view of a "right hand" rotor coil for a-c wave wound rotors. With coil in position in rotor slots, the top half of the coil is on the right side, with the observer facing the lead end of the winding. The coil shown here has 4 conductors per slot.**

The definitions given above cover the line leads or leads connected to the collector and star rings. However, there are six additional leads, two per phase, R1-R2 for the A phase, R3-R4 for the B phase, and R5-R6 for the C phase, which will be classified in this series as "reversing jumper leads."

Thus it will be observed that with the line leads, A1-A2, etc., on top, the reversing jumper leads will all be on the bottom. Or with the line leads A1-A2, etc., on bottom, the reversing jumper leads will all be on top.

Therefore the twelve leads of the a-c wave windings are divided into two groups of six leads on top coil leads and six leads on bottom coil leads. This rule applies in all cases. If the A1-A2 leads are selected to be attached to bottom coil leads, then the B1-B2-C1-C2 leads will also come out on bottom coil leads, and the R1 to R6 leads will then all come out on top coil leads. If the winding is started with the A1 to C2 leads brought out on top coil leads, then the R1 to R6 leads will all come out on bottom coil leads.

To properly mark and identify any winding of the a-c wave type, the slots must be numbered, and each of the three phase groups identified by the letters A, B, C. The slots will be divided into three groups with each group containing one-third of the total number of slots. The slots must be further sub-divided into pole groups. Thus a 72-slot, 3-phase, 6-pole motor a-c wave winding would have 24 slots per phase and 12 slots per pole.

The numbering of the slots and phase slot groups per pole must follow a definite rule as clockwise (CW), or counter clockwise (CCW), around the rotor or stator with the observer facing the collector ring or lead end.

In this series, and based on general accepted practice used in most winding diagrams, the slot numbering and phase markings will both be in the same direction, and the rotation around the windings for rotor or stator will be classified as clockwise (CW) or counter clockwise (CCW) and will be in accordance with the following rules:

*Counter Clockwise* (CCW) for windings having left hand leads on bottom, or right hand leads on top.

*Clockwise* (CW) for windings hav-

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viding top-notch service for line constru
tion and maintenance work. This body
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adequate space for equipment and too
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in delivery when truck chassis are aga
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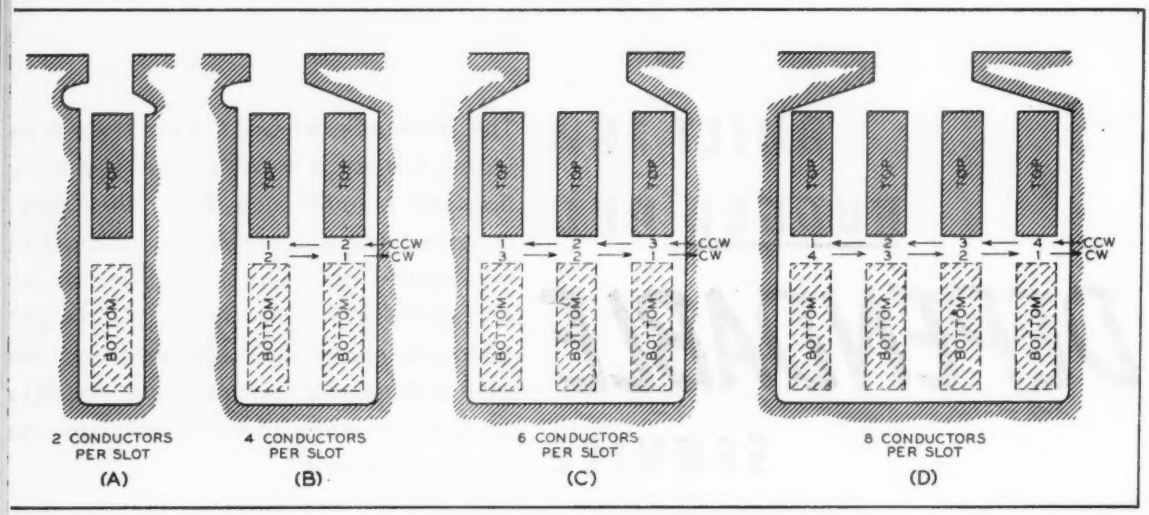



**ig. 7. Sketches A, B, C, and D illustrate the appearance f one turn, two turn, three turn and four turn coils, espectively for a-c wave winding. The numbers, arrows, nd rotation symbols between the upper and lower conduc- rs in each slot indicate the sequence of picking up coils the connecting progresses around the rotor. For windings having "left hand, leads on bottom" and "right hand, leads on top" coils, the upper row of numerals and arrows, and rotation in a counter clockwise direction, apply. For windings having "left hand, leads on top" and "right hand, leads on bottom" coils, the lower row of numerals and arrows, with rotation in a clockwise direction, apply.**

g left hand leads on top, or right nd leads on bottom.

Also, it can be stated that the slot d phase numbering will be in the rection pointed by the coil leads se- cted for the A1 to C2 leads. For ample, in Fig. 5, with the bottom ad F as the A1 lead, etc., the coil ads point in a counter clockwise rection which agrees with the CCW le for left hand leads on bottom. ikewise, in Fig. 5, with the top lead the A1 lead, etc., the coil lead oints in a clockwise direction, in ac- ordance with the CW rule of left nd leads on top.

A study of Fig. 6 indicates that with e bottom coil lead F as the A1 ad, it points in a clockwise (CW) rection, corresponding with the rule r right hand leads on bottom. In g. 6, with the top coil lead G as e A1 lead, it points counter clock- se, corresponding with the rule for ght hand leads on top.

The two usual arrangements will be und as (1) counter clockwise, left nd, leads on bottom (2) clockwise, ght hand, leads on top. In this series, e will standardize on counter clock- se, left hand, leads on bottom for ost descriptive constructional dia- ams, but will furnish four connect- g diagrams for each slot-per-pole-per- ase grouping to cover each possible se of hand and rotation of slot and ase markings.

It would be possible to have the ase markings, A, B, C, in a direc- on opposite to that of the slot num- bering rotation but this would double the number of diagrams of possible connections and serve no useful purpose. Therefore, the 1-2-3 slot numbering will also agree with the A, B, C phase rotations in this series.

### Conductors Per Slot

A characteristic of a-c wave windings is that the coils are constructed from large copper straps, made into half coils or one-piece coils, all of *one turn* as shown in Figs. 5 and 6. And in Figs. 1 and 2 of the preceding chapter. To obtain the effect of two or more turns per coil, the number of conductors per slot are increased in the ratio of turns required. These conductors are then connected as a series of coils, passing through each slot until all conductors are used up before dropping back to the next slot.

All modern a-c wave windings have the coil ends arranged in two layers. Thus in all slots, the conductors are divided into two separate groups, as shown in Fig. 7, as top conductors (solid lines) and bottom conductors (dotted lines).

*One Turn Coils* require two conductors per slot as at A, Fig. 7. Here one coil occupies two slots, i. e., bottom of one and top of another, a back pitch apart, and the end of the series of coils drops back one slot according to the slots per pole per phase.

*Two Turn Coils* require four conductors per slot as shown in B of Fig. 7. (Also see Figs. 5 and 6.) In this case the series of coils will pass through each slot twice before dropping back one slot in the short pitch section.

*Three Turn Coils* require six conductors per slot as shown in C, Fig. 7. The series of coils will pass through each slot three times before dropping back one slot.

*Four Turn Coils* require eight conductors per slot as shown in D, Fig. 7, and the series of coils will pass through each slot four times before dropping back one slot.

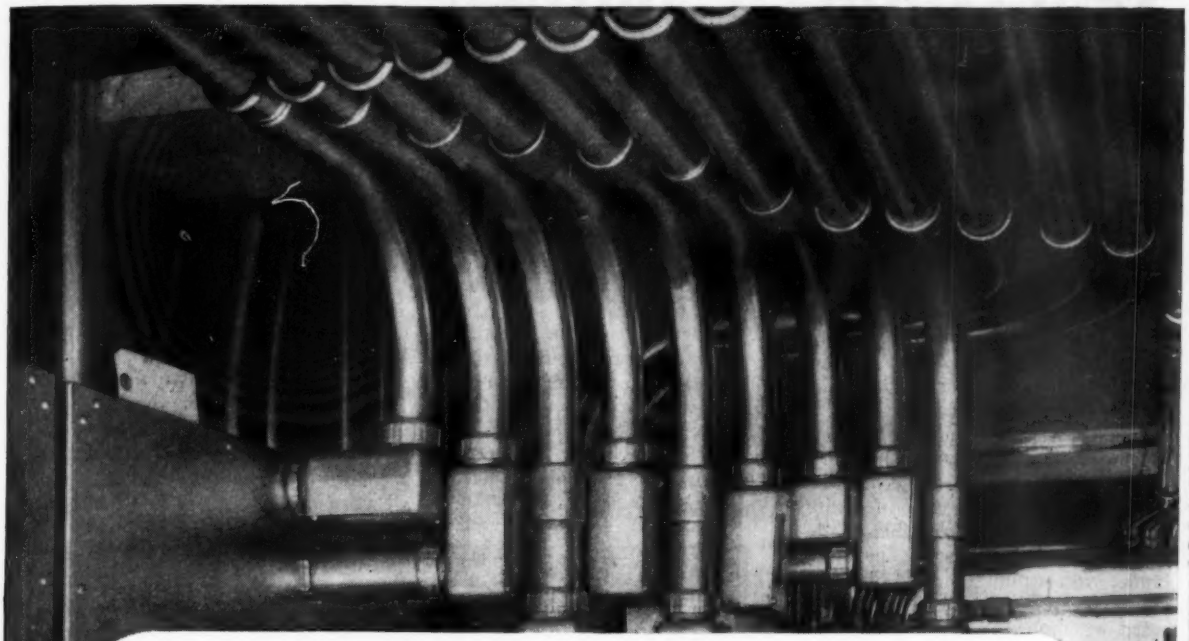
Figs. 5, 6, and 7 of this chapter and Fig. 2 of the preceding chapter show how the conductors per slot are increased, arranged, and picked up to obtain the effect of multi-turn coils.

In Fig. 7 the two, three and four conductor per slot sketches, B, C, and D, have the numbers 1 to 4 inserted between the top and bottom coil halves. These numbers together with the arrows and rotation symbols indicate how the conductors per slot are picked up in the various windings.

For "Left Hand, Leads on Bottom" and "Right Hand, Leads on Top" counter clockwise windings the pick up of conductors per slot will be counter clockwise or right to left in all slots as shown in Fig. 7 by the top row of numerals and arrows.

For "Left Hand, Leads on Top" and "Right Hand, Leads on Bottom" clockwise windings the pick up of the conductors per slot will be clockwise as shown in B, C, and D of Fig. 7 by the lower line of numerals and arrows. *(Con't on page 79)*

FOR SAFETY'S SAKE . . . USE CONDUIT *(Full Weight Rigid Steel)*



# Smart Post-War Planning Demands SAFE Wiring Methods

A double responsibility confronts the electrical industry:

1. The obligation to replace makeshift, unsafe wiring systems, installed according to "must do" emergency ideas, forced on industry by war time shortages and regulations.
2. The duty to install only assuredly safe wiring systems in all new post V-Day construction.

Remember this: The only wiring system approved by the National Electrical Code as moisture, vapor, dust and explosion proof in hazardous locations is a standard-threaded rigid conduit.

With standard-threaded rigid steel conduit, such as Youngstown's Buckeye, again available through distributors, there is no reason not to provide dependable wiring protection.

Wherever there is moisture, or vapor, or excessive vibration, or possibility of corrosion, or accumulating dust and dirt, or danger of crushing or other mechanical injury, specify and use Youngstown Buckeye Conduit.

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# Maintaining Industrial Electrical Equipment

## Part 6—Insulation*

INSULATION is one of the most important factors in the life and service of electric apparatus. When insulation fails, the machine is out of service until new insulation is applied.

There are certain principles to be considered in the use of insulating materials which may assist the maintenance man not only in anticipating the need for repairs, but also in speeding up such necessary repairs.

Some of the materials used in electrical insulation are organic in nature, and are therefore susceptible to deterioration by heat, oxygen, moisture, and corrosive fumes and liquids. Even the best are vulnerable if incorrectly used or applied, or if machines are used beyond their normal rating. The process by which a coil, winding, armature, or stator is insulated has fully as much influence on the expected life as the properties of the varnish, compound, or treating material itself.

No one insulating material, be it treating compound, varnish, tape, or slot insulation, can be expected to meet all conditions and possess all the best properties. Therefore, intelligent choice of materials is of prime importance. The properties of materials, and a clear evaluation of the service requirements for any given design of apparatus, will determine both the materials to be used and the best method of their application.

Emergency repairs, of course, are somewhat different in that materials and methods might be used that would not necessarily be satisfactory for long-term service.

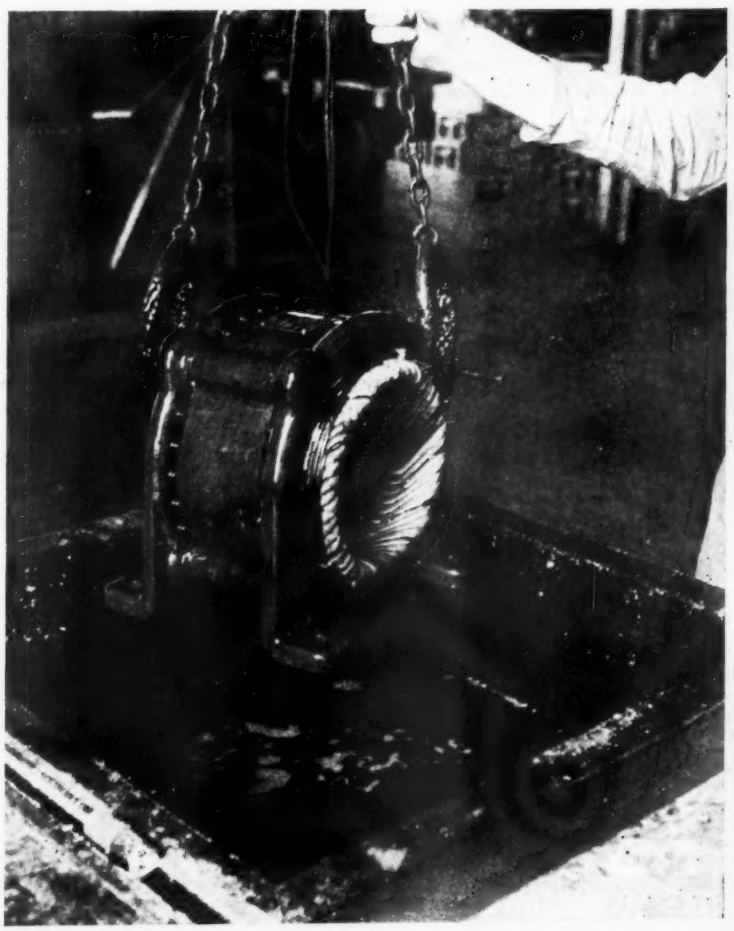
The materials which are the chief concern of the maintenance man are insulating varnishes and compounds. These materials are required by every maintenance department regardless of type or rating of electric apparatus.

An understanding of the important properties of these materials is essential. With this knowledge the proper selection and application can be made to meet specific service requirements.

Lack of a universally suitable insulating varnish makes selection a compromise. The value of the essential properties must be weighed against nonessential, although sometimes desirable, properties.

When varnishes are used for filling, they must be sufficiently flexible to withstand expansion and contraction of the winding in service. Coating varnishes may be harder. They are chosen for toughness, adhesion, oil resistance, and long life under heat, and not necessarily for flexibility. Cotton or paper insulation must be well covered by a finishing varnish to adequately protect it from attack of water, other liquids, or vapors. Film building is therefore important.

Insulation breakdowns are most often the result of internal or external heat and moisture. The heating causes chemical changes in the insulation that are aggravated by the presence of moisture.



**One of the secrets of good motor insulation is clean varnish, according to George Stratton, Armature Winding Company, Charlotte, N. C. They have several identical vats. While one is in use, another is being cleaned. At definite intervals a clean vat is changed with the one being used and the varnish is strained into the clean vessel.**

***This article is adapted from information prepared by engineers of the General Electric Co.**

# Mitchell
## Industrial Lighting

MITCHELL RLM

**ALL THE LIGHTING FEATURES YOUR CUSTOMERS SEEK!... ALL THE SELLING ADVANTAGES YOU WANT!** Every MITCHELL feature enhances the value of your industrial lighting service! Your customers are sure of more abundant, more efficient light for their workers. Greater mounting flexibility simplifies the installation job. Easier, lower-cost maintenance saves time and money. Rugged construction assures stability of performance and longer service.

**All These Features**

ALL-STEEL REFLECTORS AND WIREWAYS
OPEN-END OR CLOSED-END
BAKED ON PORCELAIN ENAMEL
"AIRCRAFT" INSTANT LATCH
INSTANT-START MODELS
EASY-MOUNT ACCESSORIES
SINGLE OR CONTINUOUS ROW
SURFACE OR SUSPENSION
U.L. AND E.T.L. APPROVED
RLM CERTIFIED

These all-around advantages, engineered and built into every unit by MITCHELL, bring you *more satisfied customers . . . easier sales . . . volume business!*

The complete MITCHELL line of 2-40, 3-40 and 2-100 watt models provides a ready answer for every industrial lighting need.

**BUILD SALES WITH THESE AIDS!**
*Distribute full-size Catalog No. 281 and Pocket-size Catalog No. 290. Each tells full story.*

MITCHELL
FIRST IN POPULARITY

**Mitchell Manufacturing Company**
**2525 CLYBOURN AVENUE, CHICAGO 14, ILLINOIS**
*(West Coast Factory and Sales Office:* 1019 N. Madison Ave., Los Angeles 27, Cal.

# A MILLION MILES

# GENERAL CABLE CORPORATION'S ST. LOUIS PLANT CELEBRATES RECORD WIRE PRODUCTION ACHIEVEMENT

## The MILLIONTH Mile of Field Wire

More than twenty months of inspired war effort on the part of the Men and Women Employees of the St. Louis Plant of General Cable Corporation were crowned today with gratifying success when the millionth mile of critical field communication wire, single conductor, rolled off the production line ready for shipment to our armed forces overseas.

"This notable General Cable achievement, one of the most significant accomplishments in the production of a vital war material to be achieved in the St. Louis area and unequalled in performance in any communication wire plant in the world, marks an epochal milepost in the production of field wire which began in the local plant in October, 1943.

More than four thousand employees working on an average of fifty-two hours per week in three shifts, seven days, are engaged in meeting the urgent requirements for field wire of the United States and its allies. Current production is running in excess of four thousand miles per day or, putting it another way, approximately five times around the globe once a month.

In commenting on the production feat of the local organization, Mr. Dwight R. G. Palmer, President of General Cable Corporation stated: 'Though the performance of our St. Louis Plant was accomplished in the ordinary line of duty, Management nevertheless is particularly gratified that its personnel, comprising all races, creeds and colors, harmoniously evidenced their patriotic sincerity by establishing this outstanding record. We salute the Men and Women of our St. Louis Plant for this production achievement'.

---

...months ago also is [court]... trate Henry H. Curran would not ... cases, he said. The central court, for the trial...

...a very great need to conserve and ... that is now ... in preparation of income tax returns. Ordinarily the O. P. A. must complete its prosecutions within one year after bringing charges. ... company contrasts sharply ... the record of delays in the ... gram for production from ...

# OF FIELD WIRE...

## Just one example of General Cable's Service to the Nation and its Allies

This output of *one million miles of single conductor communication wire* for the armed services represents the *all-out* effort at only one plant producing enough wire to encircle the globe five times each month.

All ten General Cable plants have been working three shifts, seven days per week, on this and other essential military items.

Come final Victory, General Cable will as energetically attempt to do its part in winning the peace.

# GENERAL CABLE CORPORATION

*Manufacturers of Bare and Insulated Wires and Cables for Every Electrical Purpose*

Aging or "wearing out" of the insulating material results largely in mechanical failures. Electrically the material does not wear out until breakdown occurs, which is usually after the material has become quite brittle and cracked. Aging increases rapidly with temperature, approximately doubling for each 10 C increase.

High temperature causes the dehydration of all cellulose materials, resulting in a tendency to char. These effects lead to brittleness, cracking, and shrinkage under vibration and stress, and ultimate crumbling and disintegration of the coating. The shrinkage causes the coils to loosen in the slots, and increases abrasion due to the movements of the coils under electrical forces. A good varnish will retard these effects by so bonding the conductors that reasonable life is obtained.

Although flexing of a film of varnish over a mandrel has generally been used for evaluating the aging characteristics, this test may not give an indication of the true stability of the varnish when applied to coil structures.

### How to Select Varnish

The following are the important properties for which insulating materials should be selected.

Penetration is the degree to which a varnish will permeate the supporting structure, or the tendency of the varnish to thoroughly fill the fibrous structure.

In some types of windings the insulating varnish is depended upon to bond the structure and prevent movement. This is particularly true in the following applications: (a) random-wound stators and armatures; (b) turns of form windings; (c) spool-type coils on rotating elements.

Proper bonding of coils has a second important function, that of conducting to the surface the heat generated inside the windings. A well-bonded, compact coil is better than one that has porous, air-filled insulation.

Flexibility of an insulating varnish is important where the insulation is applied to the coil before assembly, and where assembly operations subject the insulated structure (coils, leads, cables, etc.), to distortion.

Moisture resistance is a property of importance in all types of windings since water has a direct deleterious effect on electrical properties, such as insulation resistance and dielectric strength. Several factors are involved: (1) The chemical stability of the varnish used; (2) Its tendency in film form to permit the passage of moisture through it; (3) The amount of such moisture retained in the film; (4) The effect of such retained moisture on the film properties, as, for example, dielectric strength.

Since no varnish, enamel, lacquer, or paint film is 100 per cent impervious to water, moisture resistance and water repellence may be considered as relative properties, dependent a great deal on the character of the film-supporting material and upon the degree of cure of the film-forming material. Cellulose materials, such as cotton and paper, are most absorbent, the water being soaked up by wick action of the cellulose fibers. For this reason it is not recommended that untreated cellulose materials be used under moist conditions.

A useful test of the effect of water absorption on electrical properties is the dielectric-strength test, after 24 hours in water at 25 C and 85 C. The best varnishes, after remaining in water at 25 C for 24 hours, show not more than 25 to 30 per cent drop in volts-per-mil breakdown, as compared with the value when dry. The specified minimum for air-drying varnish after such a test is 300 volts per mil, and for baking varnishes 400 volts per mil.

As a measure of the chemical stability in water, two tests can be used. One: coat a rod or metal strip with a definite film thickness of varnish and immerse in water until a leakage of current can be measured. Two: the so-called "tropical test," which consists of making varnished-cloth samples or other suitable films and exposing them to steam and water in a pressure cooker at 100 to 120 C. This test will show the superiority of synthetic varnishes over those made from natural resins.

Resistance to weak acids and alkalies can be tested by submerging strips or rods, covered by a varnish film of a definite thickness, in 10 per cent acid or one per cent alkali solution and measuring leakage current and time required before complete failure occurs.

None of the natural-oil, clear-gum varnishes will withstand acids especially well, and in alkalies they are distinctly inferior to certain types of synthetics now used.

The types of service to which the apparatus is subjected will determine the importance which must be attached to these properties.

A difference should be noted between oil resistance and oil proofness. Oilproof materials are those which are not attacked by oil. Others dissolve in the oil and offer no resistance. Oil-resistant materials are those which protect against oil. These materials may become soft but will not disintegrate or dissolve in oil.

"Through curing" is the property of a varnish to cure throughout the mass, even where oxidation effects are at a minimum. It is particularly important in deep coils or where there is likely to be a heavy deposit of the varnish base. Synthetic heat-hardening type varnishes are the most satisfactory for such applications.

The dielectric strength of an insulating varnish is the breakdown or puncture voltage per unit of insulation thickness.

### Dielectric Strength

Although all insulating varnishes must have good dielectric strength, it is not required in every application. It may be of secondary importance when compared with mechanical strength or resistance to chemicals.

A good air-drying varnish should have a minimum dielectric strength of 500 volts per mil; a baking varnish 800 volts per mil. When used for producing varnished cloth that must have high dielectric strength, the value should be from 800 to 1500 volts per mil.

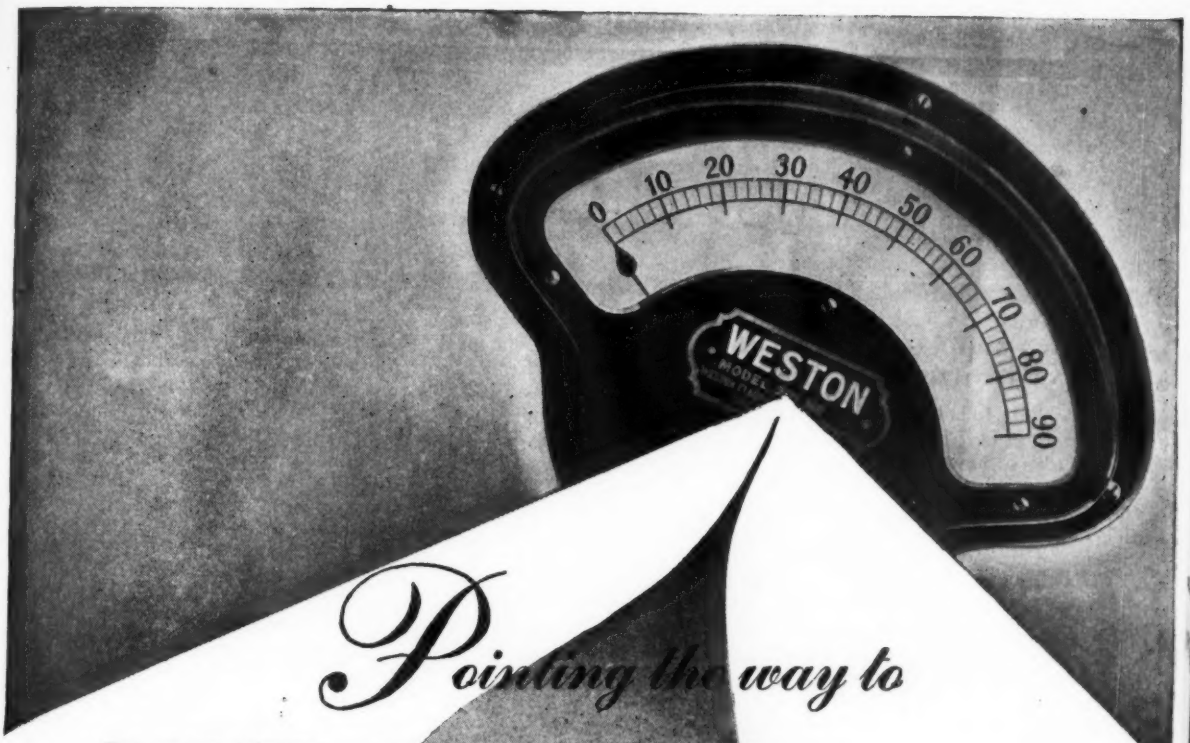
All insulating varnishes will fail under continuous exposure to an arc. Arc resistance, therefore, is of importance in those applications where protection is desired against arcs of relatively short duration. It is dependent not only upon the properties of the varnish itself, but also upon the intensity of the arc, time of exposure, and the type of material over which the varnish is applied.

The consistency at which a varnish is furnished, or at which the manufacturer recommends it be used, should be maintained by the proper addition of varnish or thinner. The best control is by viscosity, but with a single material, specific gravity control can be used.

It is very important that the varnish be kept at normal room temperature. A heavy, cold varnish that thickens, flows poorly, and does not penetrate presents a curing problem. Too high a temperature can promote chemical changes and thickening of the varnish.

Tanks or vats in which varnish is stored should be kept covered when not in use, both to prevent loss of solvent, and to prevent dirt contamina-

*(Continued on page 77)*



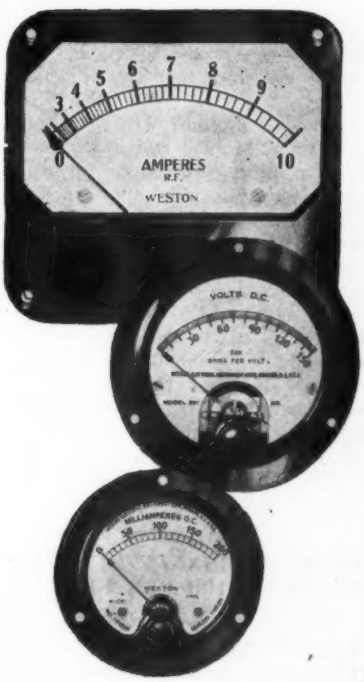

# *Pointing the way to*
# BUYER ACCEPTANCE *for tomorrow*

Many a brain-child of far-sighted companies now on the drawing-board, is destined for early birth. *Tomorrow, these products will be seeking market acceptance not only at home, but in all corners of the earth.*

With postwar markets highly competitive, manufacturers will strive to put into the product the best in materials components, and engineering skill. And if an indicating instrument is essential, it must be one not only of *proved* dependability, but one which has world-wide preference as well.

Logically, the instrument choice will be WESTON. For a WESTON on the panel gains instant recognition from equipment buyers throughout the world. To them, it is outward evidence of engineering soundness all throughout the device or machine. And to the manufacturer it brings an added sense of security . . . knowing that wherever they are used, his machines have a dependable and trouble free WESTON at the controls.

Before your equipment gets into the manufacturing stage, why not check your instrument needs with WESTON. Complete engineering service is freely offered. Weston Electrical Instrument Corporation, 578 Frelinghuysen Avenue, Newark 5, New Jersey.




# Weston

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In Canada, Northern Electric Co., Ltd., Powerlite Devices, Ltd.

# NEWS of the INDUSTRY
## National and Southern

### WPB PERMITS PLANT ADDITIONS TO UTILITIES

Revocation of virtually all controls on installation of facilities by electric, gas, water and communications utilities was announced by Edward Falck, director of the War Production Board's Office of War Utilities.

The new policy will permit utilities to make any addition to plant on an unrated basis, except construction of buildings with a materials cost in excess of $25,000, without obtaining prior authorization from Washington. Building projects costing less than $25,000 worth of materials also will be permitted on an unrated basis without authorization.

Utilities Order U-1, the basis wartime regulation covering electric, gas and water utilities, has been amended as of June 2, 1945, to incorporate this "open-ending" of construction. Utilities Order U-3, regulating telephone companies, and Utilities U-4, which applies to the telegraph companies, will be similarly amended within a few days, Mr. Falck said.

Removal of construction controls on utilities, Mr. Falck estimated, will result in utility expenditures for plant expansion next year approximately twice the total volume of expenditures during 1943 and 1944. The OWU director estimated that utility expenditures under the "open-ending" policy will be at least $1,630,000,000 in 1946, compared to $815,000,000 in 1943 and $787,000,000 in 1944. Because of the long time required in manufacture of most utility facilities, additional expenditures during the remainder of 1945 as a result of "open-ending" probably will not exceed $40,000,000, Mr. Falck added.

### HOME APPLIANCE DEMAND UP 25 TO 100 PER CENT

There will be more than enough customers for all the household appliances a quick reconversion can produce, it was just announced from Washington.

This is the conclusion of the fourth nation-wide survey of consumer needs made by the Office of Civilian Requirements. The cumulative demand for appliances jumped from 25 to 100 per cent over 1944. In units the percentages represent increases of from 1,000,000 to 2,500,000.

Projecting the results of the sample survey to national totals, here is what the nation wants:

5,835,000 washing machines
5,852,000 mechanical refrigerators
5,195,000 electric irons
5,085,000 radios
4,501,000 vacuum cleaners
4,501,000 sewing machines

### GODSHALK HEADS ELECTRIC EXCHANGE

E. L. Godshalk, president of the South Carolina Power Co., Charleston, was elected president of the Southeastern Electric Exchange at the annual conference of the Exchange held in Atlanta on June 21. W. E. Wood, executive vice-president of Virginia Electric and Power Co., of Richmond, was named first vice-president.

Other officers are: second vice-president, McGregor Smith, president of Florida Power & Light Co., Miami; third vice-president, M. C. Funk, vice-president of Appalachian Electric Power Co., Roanoke, Virginia; and J. W. Talley, executive secretary.

The treasurer and the chairmen of the accounting, commercial, engineering and operations and employee activities sections will be appointed at a later date.

E. L. Godshalk

W. E. Wood

### EASY WASHER ANNOUNCES RECONVERSION PROGRAM

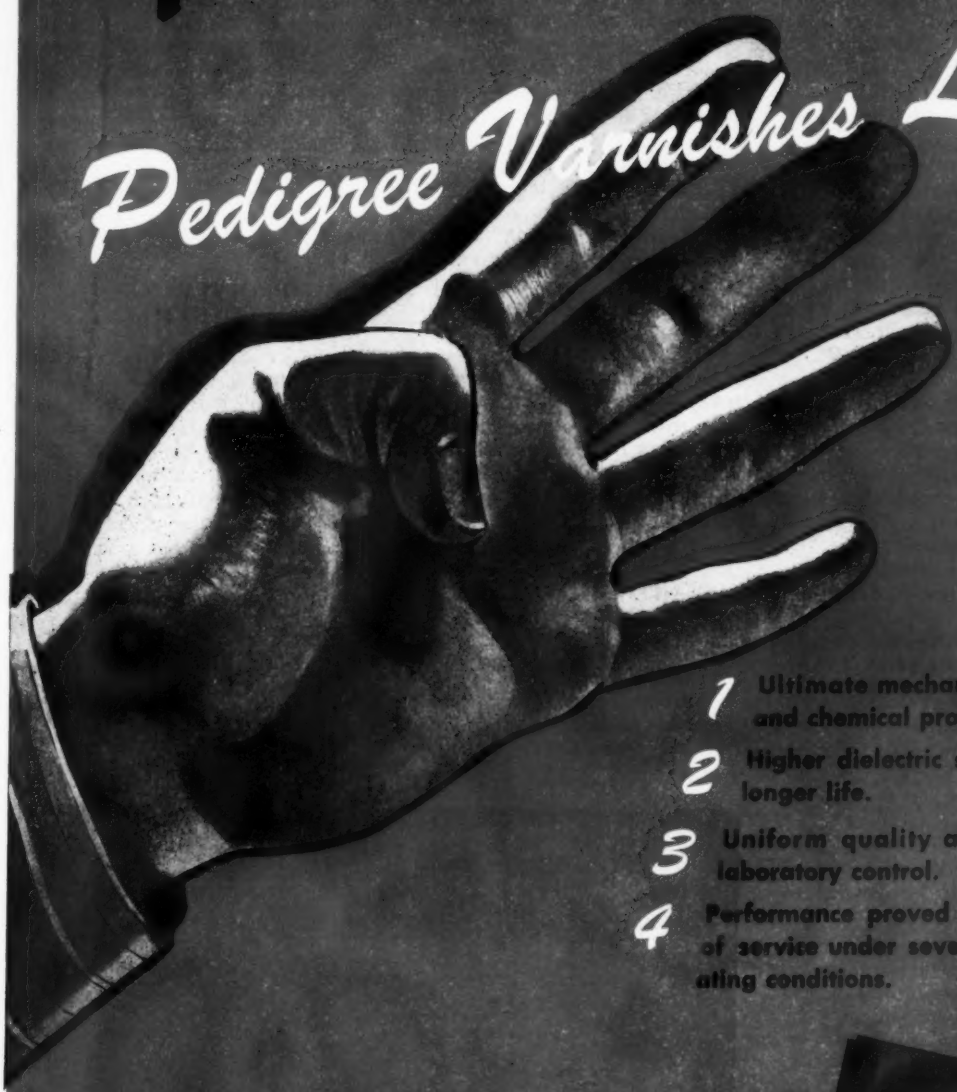
Following on the War Production Board proposed plan under which the washing machine industry will be permitted to manufacture 700,000 washers in the last half of 1945, Easy Washing Machine Corp., Syracuse, N. Y. has immediately acted on its projected program for tooling up, utilizing increased plant facilities and the securing of necessary production materials. This reconversion activity is being carried out while maintaining Easy's full production schedules of war contracts.

Until the availability of material problem is clarified, under the reconversion plan of the WPB, the company cannot forecast a definite production starting date. However, plans are being made for a limited number of washers to come off the production lines some time during the third quarter.

"It appears that washer production will not move ahead as rapidly as press reports of partial manufacturing resumption indicate," said W. H. Reeve, general sales manager of the Easy Co. "Even with all the reconversion factors in our favor, including a supply of ample manpower in the Syracuse area, it will take some months before Easy's washer production will reach substantial propor-

# 4 GOOD REASONS WHY

## Pedigree Varnishes Lead



1 Ultimate mechanical, thermal and chemical protection.

2 Higher dielectric strength and longer life.

3 Uniform quality assured by laboratory control.

4 Performance proved by years of service under severe operating conditions.

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THE P. D. GEORGE COMPANY, ST. LOUIS, U. S. A.

tions. This means it will be late in the fall before washers appear in noticeable quantities in stores. Naturally, if this present slow washer output picture can be speeded up, our company will make every effort to be among the first to resume production and deliver the finished product into the hands of our normal distribution and sales channels."

The company reports that all engineering on its immediate postwar model has been completed. This washer will be of the same basic design as the company produced when it converted to 100% war work in May, 1942. However, the new model will carry refinements and improvements. Meanwhile, until the plant reaches a normal production schedule, no new models will move forward at top speed.

As quickly as the company's war contracts will permit, tooling operations for Easy's ultimate postwar products will commence. This program will include a complete line of domestic home laundry equipment featuring: a line of spinner type washers, including a new automatic washer, a new portable washer, a line of ironing machines, and a new clothes drier.

## HURLEY RETURNS TO CIVILIAN PRODUCTION

After more than three years devoted exclusively to war contracts, the Hurley Machine Division of the Electric Household Utilities Corporation, Chicago, formally returned to the production of civilian goods on June 8, by shipping the first 50 home electric ironing machines off the assembly line to as many cities to be donated to the 7th War Loan Drive.

Following a ceremony at the plant at 11 a. m. to celebrate reconversion, the machines were taken to Municipal Airport for immediate shipment by air express.

The company, peace-time manufacturer of Thor electric washing machines and Thor Gladirons (electric ironing machines), entered war work in 1940. In March, 1942, it converted exclusively to war work. It became the largest producer in the country of boosters for high explosive shells three inches and up, and in addition supplied a large percentage of washing machines used by the armed services.

Its war production line will continue to turn out boosters and washing machines. The War Production Board has set July 1st for the date on which washing machines can again be made for the home market.

The WPB authorized resumption of manufacture of electric ironing machines for the civilian market as of May 21, but on a non-priority basis, meaning that it was up to the manufacturer to hunt down materials not needed for war. Having an inventory of materials and parts that were frozen at the beginning of the war, Thor is able to return to civilian production quickly.

According to Edward N. Hurley, head of the company, it is the first manufacturer to turn out ironers in the entire industry. He predicted it will be at least late July before housewives will be able to buy the appliance from a dealer's floor.

"While it is true that the machines we are shipping are the forerunners of thousands to come," Hurley explained, "we have more than ten thousand dealers who must be supplied with floor samples before shipments for retail sales can begin." Surveys among housewives have disclosed that electric ironing machines are high on the list of appliances they want most.

The Hurley Machine Division was founded in 1906 and also has plants in Bloomington, Ill. and Toronto, Canada.

## STEWART-WARNER NAMES KNOXVILLE DISTRIBUTOR

The Bright Distributing Company, of Knoxville, Tenn., has been appointed distributor for postwar Stewart-Warner home radios, it was announced by the Stewart-Warner Corporation. The territory covered for Stewart-Warner will include the eastern part of Tennessee.

H. C. Bright, owner of the Bright Distributing Company, resigned from the Congoleum-Nairn Corporation in February, 1944, to establish his own company. In addition to contacting the home furnishings and appliance field in the territory he will now cover for Stewart-Warner, he directed salesmen of wholesalers and developed merchandising plans during his eleven years with Congoleum-Nairn. A native of Knoxville, he is a graduate of the University of Tennessee at Knoxville.

## NEW APPOINTMENTS ANNOUNCED BY G.E.

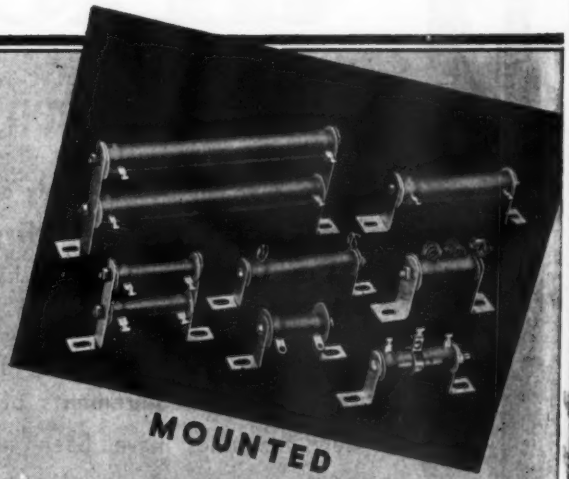
A. L. Scaife has been appointed advertising and sales promotion manager of the General Electric Company's appliance and merchandise department, it was announced recently by C. R. Pritchard, general sales manager. The appointment is one of several involving major changes in the department's advertising and sales promotion division.

Scaife, who succeeds B. W. Bullock, who has resigned, will also continue to serve as merchandising manager of the department. In his new capacity, he will be in charge of all advertising, sales promotion and merchandising plans connected with the sale of G-E

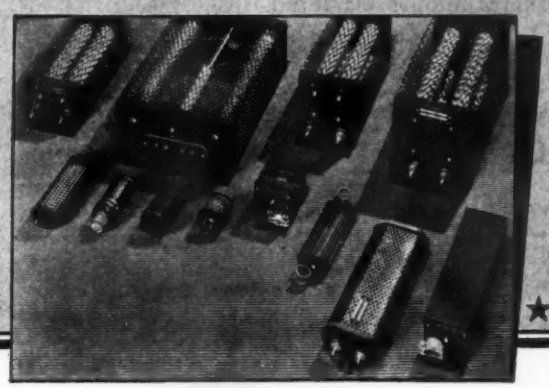
**Hurley Machine Division of Electric Household Utilities Corporation turns out first electric ironers since 1942. E. N. Hurley, chairman of the board, packs first Gladiron off line for air express shipment as company officials look on. Left to right: E. N. Hurley; H. C. Buckingham, treasurer; Frank J. Simpson, vice-president; Ralph M. Richmond, vice-president; Raymond J. Healy, secretary; Walter Oberst, vice-president and general manager, Meadows Division; Owen G. Nugent, manager Eastern Division.**

# RESISTORS

UNMOUNTED



MOUNTED



ENCLOSED

THE LINE of Ward Leonard Wire Wound Resistors has been developed through over half a century of meeting the requirements of the electric and electronic industries. The line, therefore, is complete. Ward Leonard not only offers wire wound resistors of every type, size and watt rating, but also resistor asssemblies for usual and unusual purposes. You can find exactly the resistors you are looking for at Ward Leonard.

*Send for the New Resistor Handbook. It describes the entire line giving full data on enclosures, mountings, terminals and resistance values.*

ARMY E NAVY

**WARD LEONARD**

**RELAYS • RESISTORS • RHEOSTATS**

*Electric control devices since 1892*

★ ★ ★
BUY
MORE WAR
BONDS
★ ★ ★

**WARD LEONARD ELECTRIC COMPANY · 37 SOUTH ST. · MOUNT VERNON, N. Y.**

Pioneers in
LIGHTING EQUIPMENT
Since 1880

# Faries

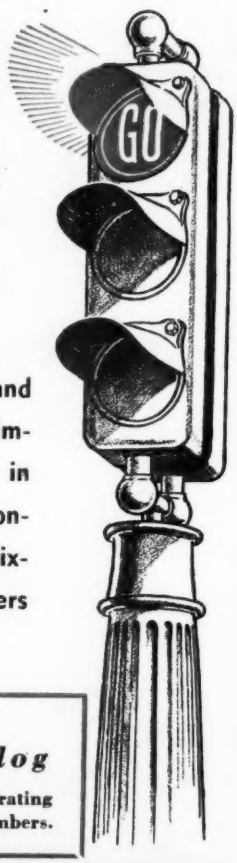
## Yes, We've Been at War

Since Pearl Harbor, our only customers have been the U. S. Army and Navy . . . and our Allies. Faries war products have been wide in range . . . more than 200 completely assembled items and component parts. To meet the exacting requirements of the Military, new machines have been employed, new production techniques mastered.

*. . . but now that the*

## Light Flashes Green

we'll soon be ready to GO with over 60 of the fastest-selling numbers from the big Faries pre-war line.




When the restrictions are fully relaxed and material is available, we're ready to start immediate production on 60 "best sellers," in accordance with a carefully-worked-out reconversion plan. These top-quality lamps and fixtures will be available to distributors and dealers for the period 'til V-J day.

New Flyer Catalog

*Write For*
*New Flyer Catalog*

. . . just off the press, illustrating these 60-odd "best selling" numbers.

FARIES MFG. CO. DECATUR ILLINOIS

major appliances, traffic appliances and construction material. He will be responsible to Mr. Pritchard.

Assistant manager of the division will be George B. Park. E. F. Vickery will be operating manager.

In announcing these appointments, Pritchard said that, under the new setup, the advertising and sales promotion division will closely parallel the organization structure announced last fall for the sales divisions of the appliance and merchandise department.

Scaife joined the General Electric Company 15 years ago as a member of the advertising division of the former specialty appliance department at Nela Park, Cleveland. In 1936 he became advertising and sales promotion manager of that Division. Then, in 1939, when specialty appliances were combined with the company's other appliance lines at Bridgeport, he was named merchandising manager of major appliances and subsequently of the entire appliance and merchandise department.

### SENTINEL RADIOS TO FEATURE WOMAN APPEAL

When the new, postwar Sentinel radios are produced, the features women like most in a radio will be built into Sentinel's complete line, according to a statement recently issued by the Sentinel Radio Corporation, Evanston, Illinois.

Sentinel recognized the fact that a woman's buying influence will be stronger than ever in the postwar radio market and has acted accordingly. Sentinel has consulted with Miss Amy Freeman, noted women's stylist, lecturer, interior consultant and former member of the editorial staff of several famous, nationally known women's magazines, regarding Sentinel's complete new line.

Working in conjunction with Sentinel's skilled and long experienced engineering designers and production experts, Miss Freeman has studied and analyzed the new Sentinel radios from the women's viewpoint. Color, cabinet design, materials, size and shape were carefully considered.

As the largest producer of Handie Talkies in the world, Sentinel Radio, at present, is engaged 100% in war work and will not resume manufacture of civilian radios until its war contracts are fulfilled. Sentinel, however, has confined its war production solely to radio, radar and electronic products. Its reconversion problem is simple and should permit Sentinel to be among the first radio manufacturers to introduce new postwar models.

# "REPEAT BUSINESS"

**A Denver dealer points out how our methods of service help him develop sales.**

"During the years that I have used your service, many competitive deals have been offered me and I have reviewed them carefully, but in my opinion none has afforded the complete advantages of Commercial Credit plans and facilities.

"Your speed in investigating and passing credits is a very real help in closing our sales. Your collection system keeps past-dues at a minimum and still retains customer goodwill. We have particularly noticed that your personnel is trained to expedite the dealer's sales and to treat his buyers with every reasonable consideration so that all possible REPEAT BUSINESS will be developed."

Herb Names Pres.
Herb Names, Inc.
Denver, Colo.

## COMMERCIAL CREDIT COMPANY

BALTIMORE 2, MARYLAND

Capital and Surplus more than $65,000,000

## ELECTRICAL BUSINESS TRENDS IN THE SOUTH

Best news in the past month for the electrical trade of the South was the revoking of numerous WPB limitation orders under which the manufacturer of electrical appliances and devices had been greatly restricted. Controls have also been lifted on installation of service facilities by electric, gas, water and communication utilities.

Priority assistance has been authorized for the manufacture of 102,000 electric ranges, 265,000 mechanical refrigerators, and 350,000 washing machines in each of the third and fourth quarters of this year.

Stanley B. Adams, director of WPB's consumer durable goods division, predicted that consumers will have a chance to buy washing machines in September at prices equal to or lower than those they paid before the war.

Volume of building permits, which reflects to some extent the activity of the construction industry and its branches such as the electrical construction industry, turned upward rather sharply in May. The South continued to lead the nation in per cent increase in building permit volume in comparison with the same month of 1944. The increase in the South Atlantic states was 50.3 per cent; in the South Central states the increase amounted to 88.5 per cent; while the increase for the country as a whole was 36.0 per cent.

## OPA ANNOUNCES NEW ADVISORY COMMITTEE

Appointment of an Electrical Supply Wholesale Distributor Industry Advisory Committee has been announced by the Office of Price Administration.

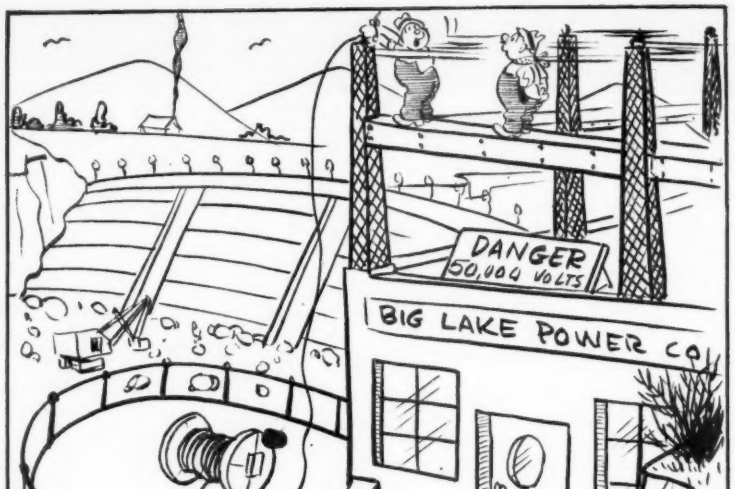
The committee held its first organzational meeting at Washington, D. C., Wednesday, June 20, 1945. Walter Shoemaker, price executive of the Machinery Price Branch of OPA, presided.

Electric supply wholesale distributors are sellers of electrical supply equipment used in construction such as wire, cables, switches, lights, and supply items such as motors and transformers.

They do not handle appliance items, such as washing machines, electric refrigerators, vacuum cleaners and toasters unless they own combination concerns doing business as both wholesale supply distributors and wholesale appliance distributors.

There are approximately 1,600 electrical supply wholesale distributors in the country. Of this number, five per cent are large concerns, 15 per cent medium size, and 80 per cent small firms.

Members of the committee from the South include: J. P. Hamblen, Southern Electric Supply Co., Houston, Texas; L. E. Salmon, Tennessee Valley Electric Supply Co., Memphis, Tenn.; P. O. West, Doubleday-Hill Electric Co., Washington, D. C.; William Farr, Electric Supply Co., Asheville, N. C.




**"—so I told him to take the infantry and stay outta' them dangerous airplanes!"**

## G. E. PRESENTS THE G-E FARM WIRING GUIDE

A new 56-page book on farm wiring called the G-E Farm Wiring Guide, which contains necessary information for planning wiring for practically any farm, was published recently by General Electric's Appliance and Merchandise Department, Bridgeport, Conn. There are many illustrations, charts and diagrams used in this book to make it more interesting and to amplify information given in the copy.

The G-E Farm Wiring Guide considers wiring layouts for entire farms describing the entrance wiring needed, farmyard wiring, the wiring for barns, machine shops, hog houses, sheep sheds, etc., and the wiring for farm residences. The number of circuits needed for each building are given and recommendations are made for placing lighting outlets, convenience outlets and switches. Sample floor plans of different buildings are shown to indicate where wiring should be installed to provide the most benefits from electricity. Blank graph pages are included so that farmers, utility farm specialists or electrical contractors can make wiring layouts of buildings they are interested in.

The purpose of the G-E Farm Wiring Guide, as stated in its frontispiece, is to help farmers decide what type of wiring they need and how much. The investment value of good, well-designed wiring is emphasized as well as the fact that electrical equipment cannot give satisfactory service unless dependable, convenient wiring is available to provide necessary electricity. It calls the attention of everyone interested to what should be done in order to get the best possible wiring for each dollar spent

A digest of the G-E Farm Wiring Guide follows:

After a short introduction, this book starts off with a simple explanation of a few electrical terms and gives an everyday analogy for each explanation. Then outdoor distribution, the wiring to the service entrances in each farm building, is explained. Next, general wiring is taken care of. The wiring for the different farm buildings and the farmyard is described in detail. Sample wiring layouts are illustrated and layout sheets are provided so that wiring layouts can be made of buildings on the specific farm under consideration. After going through all the farm buildings, the wiring for the farm residence is discussed room by room. Layout sheets are provided here too so that the wiring for each specific home can be determined.

# Modernizing a School with Light

## THE PROBLEM:

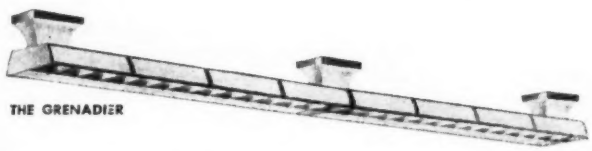
How to relight a school building which had been allowed to run down. This picture at the right shows one of the dingy classrooms with its lighting system "20 years behind the times."

## THE LIMITATIONS:

First and foremost, money. Funds had to be raised to swing the job since the school board did not have the money. Second, for the same reason, the installation must provide minimum cost operation. And rewiring must be kept to a minimum.

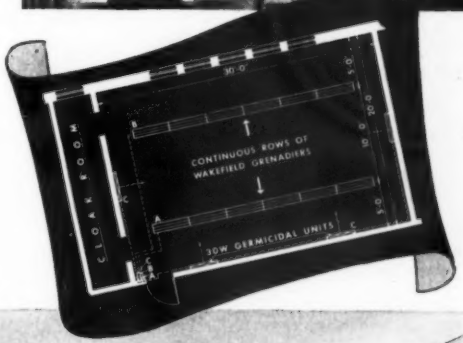
## THE PLAN:

This typical classroom layout, drawn up by lighting engineers of Birmingham Electric Co., employs fluorescent lighting, with two continuous rows of Wakefield GRENADIERS. Through these units, considerable saving in wiring time was made, since wire could be run along as an integral part of the fixture. This also reduced to a minimum the ceiling outlets necessary (required about one-third the outlets needed for previous types of lighting). Separate switch controls were provided for the units nearest the window and for the inner row.



THE GRENADIER

**Shades-Cahaba School, Birmingham, Ala.**



## THE ANSWER:

Pictured here is a standard 30′ x 20′ classroom in which is installed two rows of Wakefield Grenadiers (No. PG-2483) each row containing six units. This provides an average of 20-35 footcandles. Each unit is equipped with two 40-watt fluorescent lamps. Rows are spaced ten feet apart. Notice that the transverse louvering of the units ties in with the seating arrangement of the pupils. Four 30-watt germicidal units were also installed. The result — a lighting system that is already serving as a model for other school installations. For further details, write the F. W. Wakefield Brass Company, Vermilion, Ohio.

Wakefield

ALSO THE GRENADIER • • THE ADMIRAL • • THE COMMODORE • • THE BEACON

## SAMSON UNITED EXPANDS PRODUCTIVE FACILITIES

A 40 per cent expansion of Samson United Corporation's productive facilities at its Oswego plant by construction of a steel-and-concrete addition was announced recently.

Although the expansion was made necessary by additional and enlarged war contracts for which production room is needed immediately, the building will be available for postwar production of Samson flatirons and other civilian appliances. Such production is now being handled at Oswego because the main plant in Rochester is working wholly on war contracts, primarily turrets for the Avenger torpedo bomber and Catalina patrol bomber.

## FROZEN FOOD MARKETS TO ABSORB SURPLUS FOOD

Georgia's fruit, poultry, livestock and vegetable industries are going to find vast markets after the war as a result of modern freezing and storage devices, frozen food experts revealed recently in a three-day course in frozen food procedure, sponsored by the University of Georgia.

Paul Chapman, dean of the College of Agriculture, reported that every community in Georgia will have access to a freezer locker plant which will kill, age, cut, and perhaps package livestock and poultry. Fruits and vegetables also can be purchased in the wholesale markets and stored for future consumption at a considerable saving. He said that he did not think the community lockers would be in competition with the smaller home freezing units and that one would supplement the other.

Few families will want to dispense with the services that are rendered by locker plants, he pointed out. They will want to rent a locker for storing large quantities of food. Smaller units for home freezing will retail at around $150 each but the community lockers which will rent for around $30 a year will be more economical. The home units will be more convenient for quick freezing home-grown vegetables, fruits and poultry.

As for Georgia's famous peach industry, Mr. Chapman says that the day when fruit will rot on the trees or in box cars is gone forever.

"Recently I learned from a Macon citizen that 500 carloads of peaches will be frozen in that city this year and shipped in retail-size cartons. This is a brand-new market. It does not compete with the fresh fruit market. Such frozen markets will absorb all our surplus peaches and people in the East will be eating fresh Georgia peaches for breakfast the year around instead of in season," he concluded.

Other speakers predicted that freezing devices will be a boon to Georgia's rapidly growing poultry business in that they would eliminate much live poultry trucking.

Other speakers were H. H. Plavvs, of Iowa State College, who talked on freezing fruits and vegetables; R. G. Purnell, of Tupelo, Miss., who spoke on preparing food for freezing; Dr. John Powers, of Massachusetts State College, who spoke on quick freezing methods, and R. L. Brooks, of the Georgia Power Company.

## EXPANDED PRODUCTION PLANNED BY CROSLEY

Greatly expanded production of electric refrigerators and home radio receivers in the postwar period is planned by The Crosley Corporation, James H. Rasmussen, general sales manager, of the Crosley manufacturing division, informed Crosley regional and merchandising managers at a recent sales conference here.

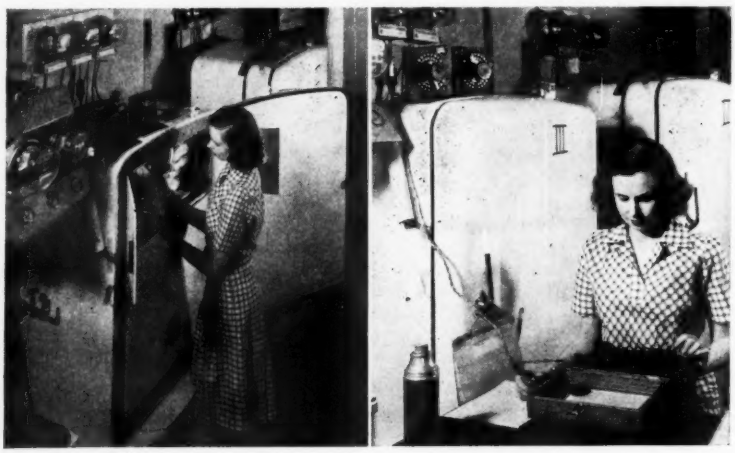
"Through a two million dollar expansion program, Crosley will greatly increase its refrigerator production capacity in the first year after production is resumed," Rasmussen said. "WPB has now programmed a very limited refrigerator production for the last half of this year but big volume production probably won't get under way until 1946.

"WPB has said that regular civilian radios probably will not be in production this year, but if the Jap war goes as well as we all hope, WPB may be able to advance its civilian radio production program. We will also add the radio production facilities required to expand sharply our prewar radio production capacity."

Rasmussen supported the recent statement by R. C. Cosgrove, vice-president and general manager of Crosley's manufacturing division, that war production is tapering off gradually, thus permitting an orderly conversion to peace-time manufacture.

"During 1945, up to April 30," Rasmussen said, "Crosley sales totalled more than $39,000,000. April war material billings were less than those in March and promise to decrease gradually for the rest of the year, making more and more facilities each month available for civilian production.

"Even with our present facilities at Richmond, Indiana, where our refrigerator production will be concentrated, we will be able to build many



**NEW HOME FREEZER HAS "REACH-IN CONVENIENCE"—The new upright home freezer, which will be manufactured by the Westinghouse Electric Appliance Division shortly after civilian production of consumer durable goods is resumed, is the companion piece to the household electric refrigerator in size and finish, with front-opening door and sectional inner doors for reach-in convenience. Shown transferring a steak, with thermocouple attached to measure temperature within the meat, from the freezing section to a storage compartment of an experimental model home freezer is Miss Jane Schleicher, member of the Westinghouse Home Economics Institute staff. Thermocouples, in effect miniature and highly sensitive thermometers, give a complete history of temperatures within the foods at all times. In addition to Institute research on freezing and storing foods, engineers and technicians conduct numerous tests on the new home freezers, including studies on the freezer mechanism and cabinet, in two special, tightly sealed, copper lined humidity rooms and in a soundproof room mounted on giant springs. At right, Miss Schleicher is shown taking potentiometer readings of thermocouples which measure temperatures within the foods.**

*Because of the basic importance of adequate wiring to the entire electrical industry, Anaconda is presenting messages like this in a wide list of national publications.*

**yet inadequate electrical wiring can rob appliances of that much performance—**

# . . . *In postwar planning,* Wire ahead

YOU MAY spend a good deal on future electrical comforts—a new refrigerator and range, de luxe laundry equipment, advanced heating, perhaps air conditioning, and a host of appliances.

Don't undermine this investment. Realize that out-of-date electrical wiring in the house can cut equipment performance twenty-five to fifty percent!

If you anticipate an increased electrical load on *your* wiring, make sure to have enough circuits, service devices and outlets. In other words, check up on your postwar wiring plans now and avoid expensive changes later.

Business executives! Don't neglect *your* postwar wiring plans. It costs nothing to check them now, but it may cost plenty later for shutdowns, alterations. Talk it over with your consulting or plant power engineer, electrical contractor or power salesman. They'll agree that it's always wiser to Wire Ahead! Anaconda Wire & Cable Company, Subsidiary of Anaconda Copper Mining Company. General Offices: 25 Broadway, New York City 4. Chicago Office: 20 North Wacker Drive 6. Sales Offices in Principal Cities.

*✓ Check your wiring plans before they check you!*

HELP BRING VICTORY SOONER ...BUY MORE WAR BONDS

ANACONDA

**ANACONDA WIRE & CABLE COMPANY**

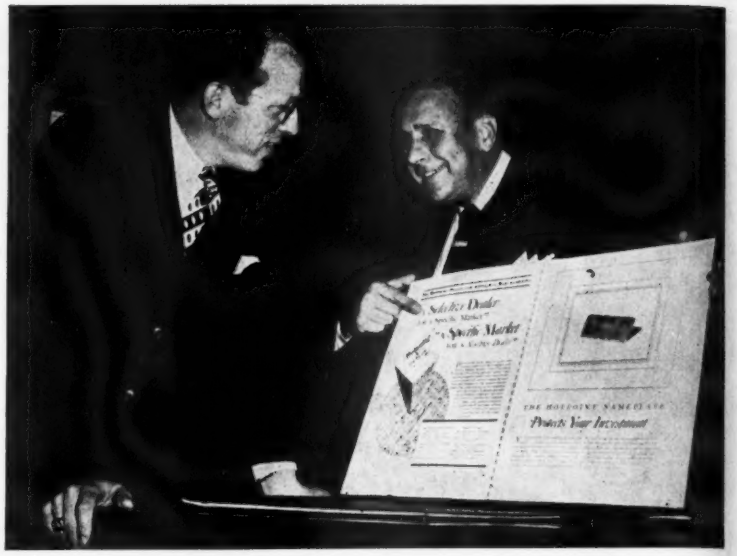
more refrigerators than ever before. This does not take into consideration the plant additions and new engineering and office building that are being planned there.

"Refrigerator production will be streamlined at Richmond, with raw materials entering one end of the plant and the finished product leaving at the other end.

"We expect greatly increased competition in the radio industry production capacity. We expect to be in a buyer's market within four or five months after the industry hits full production schedules."

Rasmussen said that it is still too early to forcast what postwar prices will be but that he expects them to be from 15 to 30 percent above prewar prices. He said he didn't believe it would be possible to freeze prices at the March, 1942, levels as has been suggested.

"None of us want lower labor rates," he asserted.




**SELECTIVE DEALER PLAN—F. B. (Fritz) Williams, (right) Atlanta, southern regional manager for Hotpoint explains his company's postwar selective dealer plan to H. J. Scaife, western regional manager, at a recent meeting in Chicago. Williams said the plan is "tailor-made" for all-electric complete kitchen and complete home laundry dealers. The plan emphasizes exclusive territory protection for dealers displaying complete Hotpoint line.**

## EUREKA EXPECTS CLEANERS AND IRONS BY FALL

First deliveries of vacuum cleaners and cordless electric irons by the Eureka Vacuum Company are expected this fall, George T. Stevens, vice-president and manager of the company's Eureka division, announced at a dinner meeting of the organization's employees in the Book-Cadillac Hotel, in Detroit.

"While our high volume of war production will continue so long as it is needed by the armed forces," Stevens said, "favorable war conditions indicate that limited consumer goods manufacturing will soon be possible so that the public will begin to get some of these long-needed home appliances."

He announced that his company will offer for the first time a complete home cleaning system, consisting of an upright unit for rugs and carpets, a tank-type cleaner for "above the floor" cleaning, and a set of attachments, including a power-driven floor waxer.

Stevens said the cordless electric iron, announced by the company a few months ago, will be the first of a group of supplementary home appliances that the Eureka Company will produce.

The Eureka Company recently acquired the Williams Oil-O-Matic Company, of Bloomington, Ill., and will operate it as a separate division. Completely engaged in war work at present, as its parent company, Williams will resume production of oil burners, heaters and air-conditioning equipment as soon as war conditions permit, Stevens said.

Appointments of new sales executives, merchandising and advertising plans will be announced shortly, he said.

## ANACONDA DEVELOPS CABLE FOR VICTORY

The war's Naval production spotlight was focused recently on Anaconda Wire and Cable Company's plant at Hastings-on-Hudson, N. Y., as the story of Allied Navies' success in overcoming Germany's magnetic mine menace to convoys and shipping unfolds.

Experimental data offered by the British to our Navy called for equipping mine sweepers with mine sweeping apparatus charged with electricity, to explode submerged mines from channel and the oceans. This called for the use of buoyant insulated "Floater" cables to create a magnetic field as they were towed through the water.

The Anaconda Wire and Cable Company with only a minimum of information, and in close and extremely secret cooperation with the Navy, immediately tacked another "big order" on its war effort calendar and poured all of its engineering and research talents into the job of producing a cable that would float, carry an adequate load of electricity and withstand the explosive effect of the mine as well as the elements. This pioneering and the success by Anaconda led the firm into becoming one of the world's largest manufacturers of buoyant mine sweeping cable.

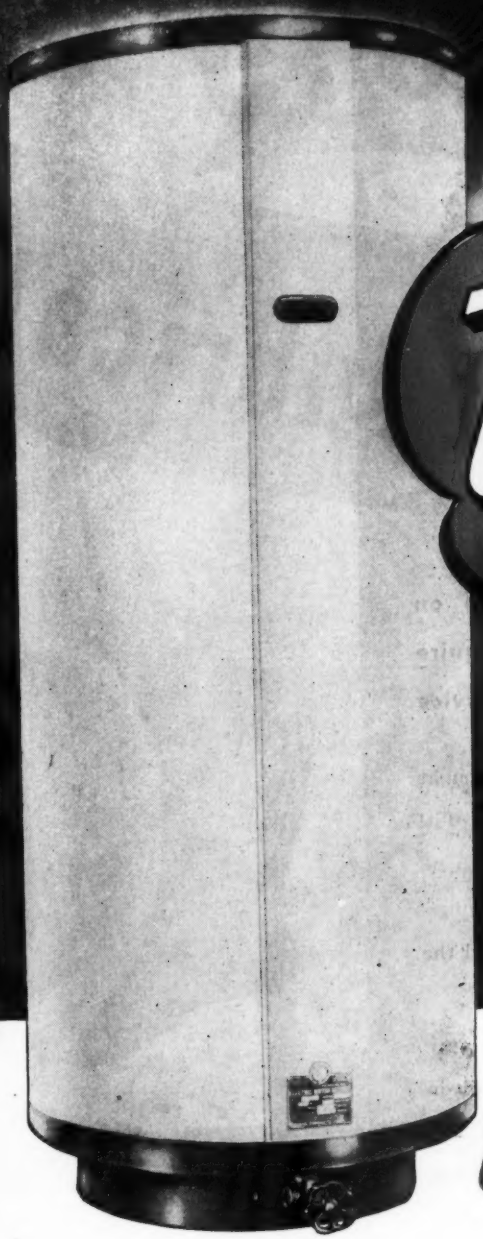
Construction of mine sweeping buoyant cable presented many headaches in the beginning because it was necessary to make cable that would be capable of carrying a terrific electric load and at the same time be light enough to float.

Each manufacturing operation required new machinery, all of which had to be especially designed and built for this cable. Today, one whole avenue of the Hastings Mill is given over to the buoyant cable operation. There are huge vulcanizing tanks, stranders, winding machines and water-testing tanks, as well as a large supply area where materials which go into the finished product are stored and assembled.

Navy men who have returned from mine sweeper duty have been loud in their praise of the performance of Anaconda's buoyant cable. The cable is carried on the reel in the rear of the ship and is released much in the same fashion that a fisherman lets out a trolling line. As the ship travels its course, the electrically charged cable sets up a magnetic field over an extensive area and submerged mines explode harmlessly.

Today, Allied minesweepers, equipped with Anaconda buoyant cable, are writing finis to the Jap's mine fields.

THE WORLD APPROVES ELECTRIC WATER HEATING



White

ELECTRIC WATER HEATERS

Since 1930

GOOD Construction Efficiency Appearance Price

★ The White Electric Water Heater is a Product of Utmost Quality—Merchandised Exclusively Through Recognized Distributors and Public Utilities • Your Inquiry Will Be Appreciated

Buy War Bonds

White PRODUCTS CORP.
MIDDLEVILLE, MICHIGAN

Keep War Bonds

# Install in 1945 do not lubricate

**Prelubricated ball bearings, now standard on Westinghouse CSP Motors up to 3 hp, require lubrication only after five years' or more service**

Westinghouse Type CSP Motors, 3 hp and below, bought in 1945, will not require lubrication before 1950. Think of it! Five years of operation : : : 24 hours a day : : : with no attention whatever to lubrication. In 1950, inspect bearings. If greasing is needed—a simple disassembly job—and the motor is all set to run until 1955.

These prelubricated sealed ball bearings have been thoroughly field-tested in textile mills and in built-in machine tool installations. Early installations are still running on the original grease after seven years' service.

CSP motors may be mounted in any position, including the vertical. Wherever Class A insulation is applied, at least five years of operation without greasing may be expected. Applications in higher than normal ambient temperatures may require modified design.

For complete information, ask for DB-3100-CSP at your Westinghouse office. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-21326

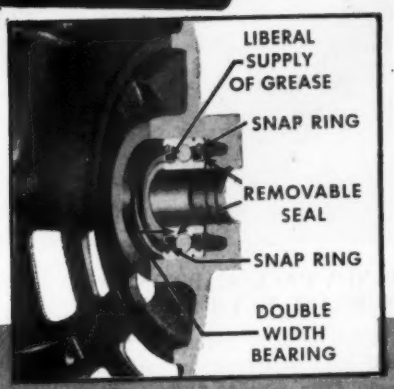
**ONLY WESTINGHOUSE CSP MOTORS OFFER ALL THESE ADVANTAGES**

- **PRELUBRICATED SEALED BALL BEARINGS** reduce lubrication maintenance . . . assure longer grease life.
- **IMPROVED TUFFERNELL INSULATION.**
- **DYNAMICALLY-BALANCED ROTOR.**
- **DIE-CAST ROTOR** with oversize fan.
- **LIBERAL THROUGH-VENTILATION**—air enters front, leaves at drive-end of motor.

# before 1950!

This label appears on the end bracket of every CSP motor up to frame 225. It is your assurance of smooth operation, long bearing life, and low maintenance. It also means:

- No overgreasing.
- No grease seepage into windings.
- No unreplaced plugs.
- No costly lubricating schedules.
- No grease contamination.
- No "skipped" bearings while greasing.




## HOW IT WORKS

High-grade, long-life grease, specifically designed for these bearings, is packed into the bearing assembly by the bearing manufacturer. This original grease is good for at least five years of normal service. Double-width, single-row construction permits a more liberal grease supply and better sealing than the single-width design. Two seal discs, locked into the outer race by snap rings, fit closely over the inner race to form a revolving seal.

When motor is disassembled for other reasons, this construction keeps dirt out of bearings just as effectively as the cartridge bearings now in common use.

**Westinghouse**

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

**TYPE CSP MOTORS**

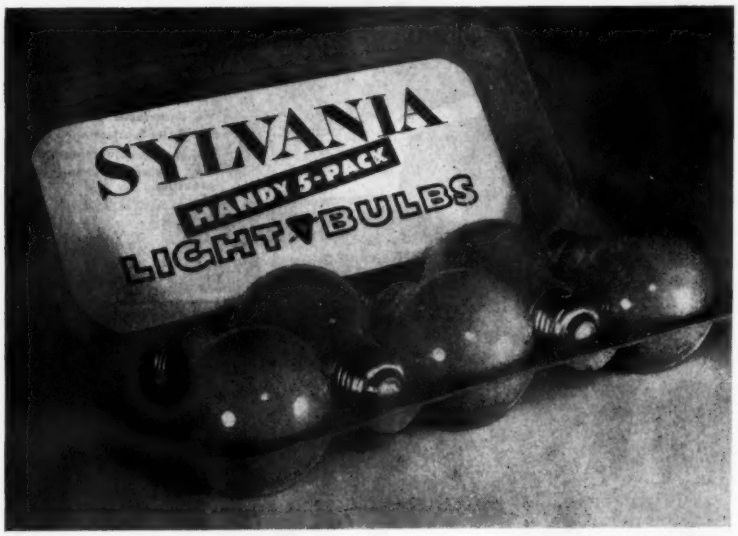
## DISTRIBUTOR APPOINTED BY STROMBERG-CARLSON

The Adair Appliance Company, wholesale distributors, of Memphis, Tenn., has been appointed a distributor for Stromberg-Carlson radios, according to recent announcement by George D. Adair, general manager of the distributing firm. The company will also distribute in the Memphis trading area Marion electric ranges and water heaters, Dexter washers and ironers, Wilson Cabinet Company refrigeration, Hunter fans, National sewing machines, and many other well known appliances.

The territory covered by this distributing firm includes eastern Tennessee, western Arkansas, northern Mississippi, and part of Kentucky.

**Geo. D. Adair**

Mr. Adair, who has been associated with the electrical and communications field for more than 25 years, was once associated with the Carter Electric Company, of Atlanta. From 1919 to 1942, he held various branches in Atlanta, Nashville, and Memphis. In 1942, Mr. Adair accepted a post with the electrical section of the WPB Office of Civilian Requirements.




## HANDY-PACK CARTON TO INCREASE BULB SALES

Sellers of light bulbs can look forward to a much greater unit of sale at no extra cost to them, either in money or in sales time, if light bulbs are offered in a "handy-5-pack" similar to one now being pretested for postwar use by Sylvania Electric Products, Inc.

This container capitalizes upon the housewife's almost universal habit of buying eggs in shock-proof molded cartons. In addition to holding the bulbs safely and snugly, advantages for the consumer include convenience in carrying and in storing light bulbs at home. Breakage, it is expected will be materially reduced. Equally important, such a "handy-pack" would cost the consumer nothing extra.

To the retailer, the carton offers many advantages. It trades the unit of sale up from one or two bulbs to five at a time. It encourages complete self-service on the part of the buyer. Lastly, it eliminates the need and cost for extra wrapping.

If this design is adopted and offered on a national basis, plans will probably call for both a factory-packed carton and a carton that would be filled from light bulb bins by the buyer herself. This flexibility in merchandising is an important feature of the new device.

Retailers who have seen this package in its experimental form have hailed it as a revolutionary advance in light bulb merchandising, and recent Sylvania surveys of the light-bulb habits of 3,000 housewives suggest that they, too, will welcome its convenience features.

## FLORIDA REPORTING THE ELECTRIC NEWS

The Largo Electric Company of Largo, Fla., has recently moved to larger quarters in the Ulmer Building at 103 Bay Drive from its former location in the Belcher Building. The extraordinary expansion of this firm, which is but several months old, is due to a need to make room for a larger workshop for repairs on electric appliances, and to obtain more space for display purposes.

R. C. Fleming, the owner, now employs two men for service and repair-work, while Mrs. Fleming is in charge of the office.

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E. B. Brant of the Florida Power Corporation, of St. Petersburg, is nursing a bruised hand due to the many congratulations he has received for the prize he won in the design of fluorescent fixtures sponsored by the Sylvania Electric Products, Inc.

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The Florida Electric Supply Company, of Tampa, has recently opened a branch house at 2695 Roselle Street, Jacksonville. Sales and service are headed by W. G. Wood and Ned H. Morgan respectively. The territory to be covered by the new branch will include West and Central Florida and South Georgia.

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The Strickland Sales Company, of Tarpon Springs, recently installed a complete all-electric plant at their sales room on S. Pinellas Ave. for the purpose of recapping tires. The department will be under the supervision of John Strickland.

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The second ship built in Tampa for civilian use since the beginning of the war slid down the ways of the Tampa Marine Corps on May 2. It was an 85 foot tug for the use of the Florida Power Company, of St. Petersburg. It was christened the A. W. Higgins, named after the power company head. It was christened by Miss Irene Phillips, of St. Petersburg. The maid of honor was Miss Pauline Binns, of the same city.

The A. W. Higgins is the largest tug in local waters. It is of all-steel welded construction, with Diesel motors. Its tonnage is 180.

---

Roy A. Parker, of Bradenton, has remodeled his show room to get ready for the postwar trade. He is looking forward to the time when his two sons,

# SAMSON HEATING PADS

**With the SAMSON Patented SAFE-T Selective Heat CIRCUIT, current is automatically regulated to keep heat "fixed" at the temperature** **selected, and each "fixed" heat has 4 Safety Thermostat Controls.** **This *patented* safety feature prevents overheating, saves electricity. Genuine wet-proof** **permanently sealed cover permits safe use of wet applications. Zelan-treated cover fabrics resist stain,** **repel water, can be cleaned repeatedly. Soft padding insures cushioned** **comfort. Strain-relief switch** **withstands abuse. Choice of many models,** **individually boxed** **to form a self-selling counter display.**

*The facilities that won the Army-Navy "E" for Samson United assure volume peacetime production of quality electrical appliances.*

ELECTRICAL
SAMSON
APPLIANCES

**SAMSON UNITED CORPORATION**
**ROCHESTER 10, N. Y.**

**Samson United of Canada Limited, Toronto**

with the Army and Marine Corps, will return to cooperate in the large electrical construction and house-wiring service which he anticipates. He is now installing a complete service shop. The newest in welders, lathes, drill presses, etc., will feature the new installations. He will add to his stock a complete line of major and traffic appliances.

After 35 years in business in Bradenton, he believes that his postwar business will be "tops."

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The Electric Shaver Repair Service in the La Plaza Building, St. Petersburg, claims that it is in a "class by itself" for it has no competitors in the field in St. Petersburg. It is the only shop in the city devoting itself exclusively to the repairing and reconditioning of electric shavers. Since its founding two years ago, it has enjoyed continuous success. It is owned by Stanley Garrett May who claims that he is the "dean" of all men continously in the electric shaver repair business.

Factory-trained at the Schick plant at Stamford, Connecticut, he in time became the service manager for the entire eastern district. He gave that up to enter business for himself in Philadelphia where for nine years he devoted himself exclusively to the repair of all kinds of electric shavers. He then moved to St. Petersburg.

## HEALTH-MOR BEGINS STORE TRAINING PROGRAM

The first trial of a new, Health-Mor plan for training department store vacuum cleaner salesmen through actual store sales demonstrations by factory representatives has met with unqualified success, according to Albert E. Kramer, vice-president of Health-Mor, Inc., manufacturers of Filter Queen vacuum cleaners. A test of the plan, made at Block's, prominent Indianapolis department store, produced Filter Queen vacuum cleaner advance orders in excess of $10,000, over a ten day period from May 9th to May 19th.

Health-Mor representatives, working with the Block management, arranged for a suitable demonstration location, supporting newspaper advertising and promotional material. Health-Mor factory demonstrators then took over and instructed store salesmen, by floor demonstration, in actual selling procedure.

Results of this type of factory representative training for retail store personnel have proved so spectacular wherever tried, according to Mr. Kramer, that Health-Mor expects to expand this service as rapidly as possible under present conditions, eventually making it available to any Filter Queen retail outlet at short notice.

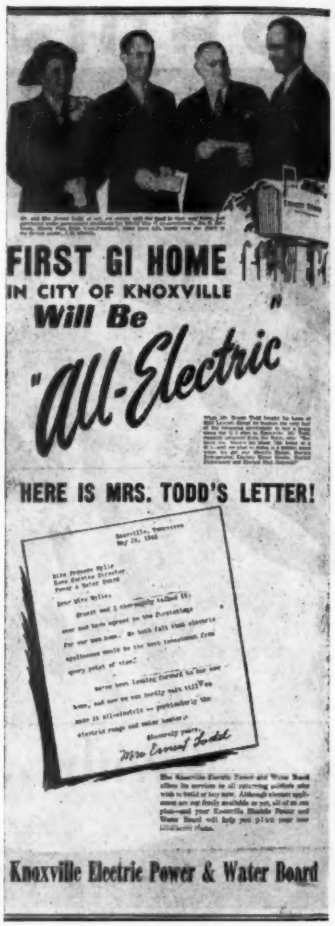
## FIRST KNOXVILLE GI HOME ALL-ELECTRIC

An indication of the electrical trend in the South was revealed in a recent ad of the Knoxville Electric Power and Water Board stating that the first GI home in Knoxville will be all-electric.

The ad pictured Mr. and Mrs. Ernest Todd with the deed to their new home, just purchased under government provisions for World War II ex-servicemen.

The ad explained:

"When Ernest Todd bought his home at 2533 Lawson Street he became the very first of the returning servicemen to buy a house using the GI plan in Knoxville. Mr. Todd, recently returned from the Navy, says: 'Believe me, there's no place like home to a GI —and we plan to make it a perfect home when we get our electric range, electric refrigerator, electric water heater, electric dishwasher and electric sink disposal."




A letter from Mrs. Todd to Miss Frances Wylie, the board's home service director, was also reproduced, in which she said:

"Ernest and I thoroughly talked it over and have agreed on the furnishings for our new home. We both felt that electric appliances would be the best investment from every point of view.

"We've been looking forward to our new home, and now we can hardly wait until we make it all-electric—particularly the electric range and water heater."

**Manufacturer of Filter Queens begins training of demonstrators.**

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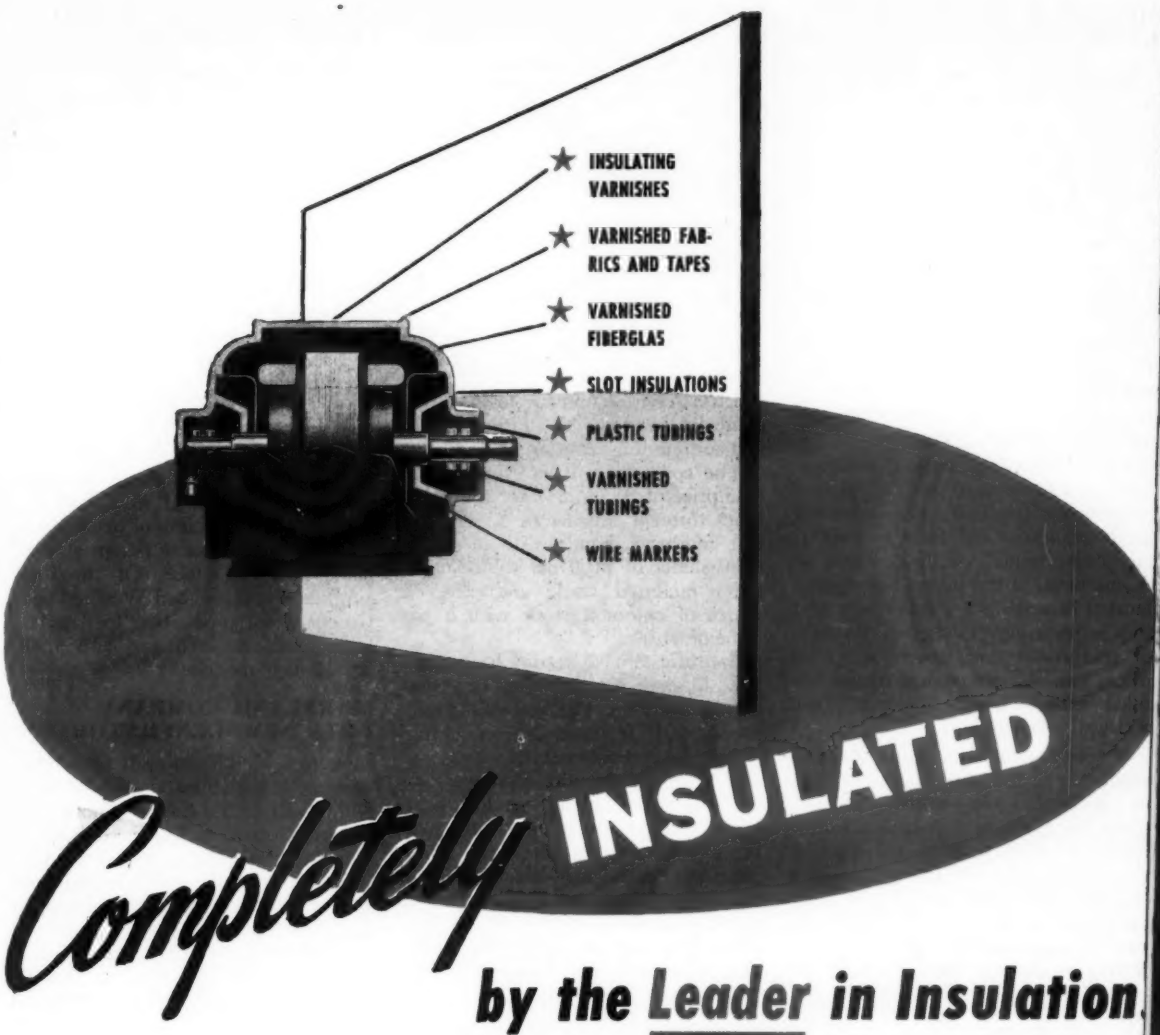
### 70-Mile Life Raft Searchlight

Rubber life rafts are equipped with searchlights, the size of a walnut, that can send a 1,500 candle-power beam for 70 miles.



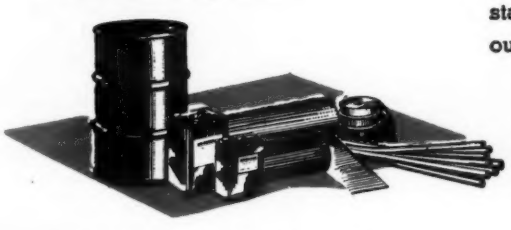

# Completely INSULATED

## by the Leader in Insulation

Motor manufacturers have come to the realization that the specification "Completely Insulated by Irvington" means longer motor life with less chances of electrical failures. Basic to this is the fact that every Irvington insulation has been formulated to produce definite and outstanding characteristics — resistances to the agents of motor destruction — heat, corrosive fumes, excessive moisture, etc. Insulations have been designed for regular and unusual motor needs — matched to work with each other for blended, smooth acting motor performance — to produce long-lasting and dependable motors. From this one source, *Irvington*, you can obtain insulations not only for motors but for all other electrical equipment as well. Each and every product is kept to Irvington's high standards by strict laboratory and production control. We offer our cooperation and invite your inquiries. Write Department E

**IRVINGTON PRODUCTS include:**

***Core Plate, Finishing and Sticking Varnishes • Varnished Canvas and Duck • Varnished Nylon, Rayon and Silk • Varnished Papers • Insulating Punchings • Fibron Plastic Tapes • Cardolite Compounds***



**IRVINGTON**
**VARNISH & INSULATOR COMPANY**
**Irvington 11, New Jersey, U. S. A.**

## MINIATURE KITCHEN UNITS GUIDE PROSPECTIVE BUYERS

Postwar distribution plans of the American Central Manufacturing Corporation, Connersville, Indiana, include a new sales help to the dealer in the form of a "Plan-A-Kit"—an adjustable, easily operated board upon which the customer's kitchen layout can be reproduced to scale in a matter of minutes.

Miniature units representing the complete American Central line of steel sinks, wall and base cabinets, to the scale of one inch to the foot, permit the dealer to create before the customer's very eyes an accurate layout of her finished kitchen.

First setting the outline measurements on the board to the kitchen dimensions required, the salesman locates windows and doors by inserting plastic models of these openings. A sink panel of the proper size is then located beneath the window as a first step in planning the kitchen. Replicas of refrigerator and stove are set in place, and the intervening spaces are filled with similarly "tailored" base and wall cabinet units.

Proper step-saving is taken into consideration in the arrangement of major appliance and utility cabinets. Corner wall cabinets make it a simple matter to carry wall storage space around the sides of the room in a smooth, unbroken line. Upon completion of the layout, a final floor plan can be supplied the customer by inserting a prepared sheet of paper under the proposed kitchen arrangement and outlining the sink and cabinet units in their correct position.

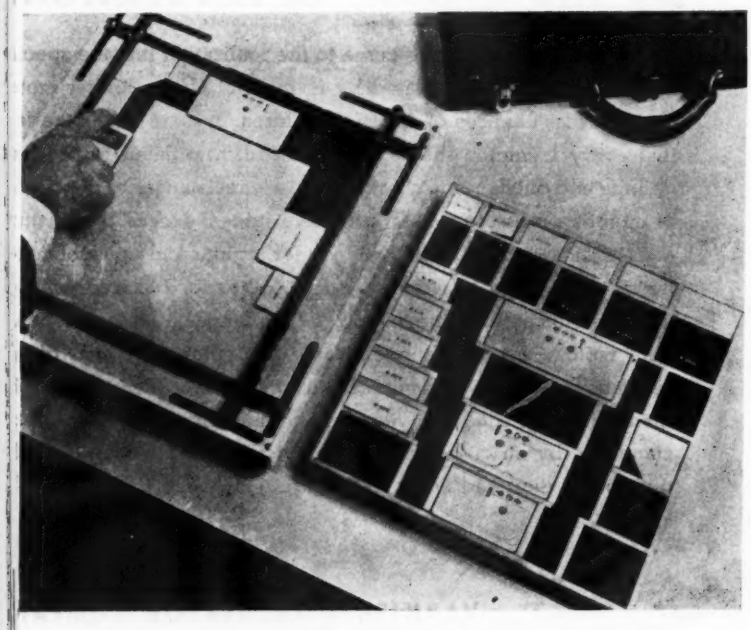
Several possible arrangements can be studied by the customer in this way, as an aid in making her decisions, and as goals for supplementary purchases if her budget does not permit immediate installation of all the kitchen equipment desired.

## PLANS CARRIED OUT FOR NEW S. W. SERVICE CO.

Organization plans are being carried out for the formation of a new firm to be known as the Southwestern Electric Service Company to serve residents of Jacksonville, Marlin, Mexia and surrounding sections in Texas.

The company will pay the SEC a base price of $4,346,858 for the properties through issuance of $2,375,000 first mortgage bonds, due in 1975; 8500 shares of $100 par value cumulative preferred stock; and 128,935 shares of common stock with a par value of $1.00

Southwestern Electric has asked SEC to grant it exemption from competitive bidding. The bonds and preferred stock are to be offered to the public or institutional investors and the common to the holdovers of Southwestern Public Service common stock at the rate of one share of common in the new company to each five shares held. Southwestern Public Service would deposit $4,000,000 of the proceeds thus acquired under the indenture securing its first mortgage bonds.



**How miniature kitchen units are used to help prospective purchaser.**

## FAN PRODUCTION STARTS AT WESTINGHOUSE

The first electric fans for civilian use manufactured by the company since May, 1942, are coming off the assembly lines of the East Springfield, Mass., plant of the Westinghouse Electric Corporation, it was announced by J. R. Weaver, works manager. Civilian sale, however, is restricted entirely to hospitals, with plants and other essential uses.

The fans now in production at the Electric Appliance Division, Mr. Weaver said, are a part of the fan program authorized for civilian purposes by the War Production Board.

The company is making two models, Walter B. Massenburg, manager of the fan department, said. Both are oscillating fans for desk or bracket use, and both are the same design as were made before the war. Of the total number of fans assigned Westinghouse Company for production to date,16,000 are the 16-inch size, and 4,900 are 12-inch models.

## MARYLAND COMPANY GETS NEW GENERATOR

A new 7,500 kilowatt generator, nearing completion at the Vienna, Md., plant of the Eastern Shore Public Service Co., of Maryland, will increase electric production on the Delmarva peninsula approximately 40 per cent, Lewis Payne, president of the company announced recently.

The expansion of the plant was described as the first step in a $6,000,000 postwar program to be carried out throughout the Delmarva peninsula during the next five years.

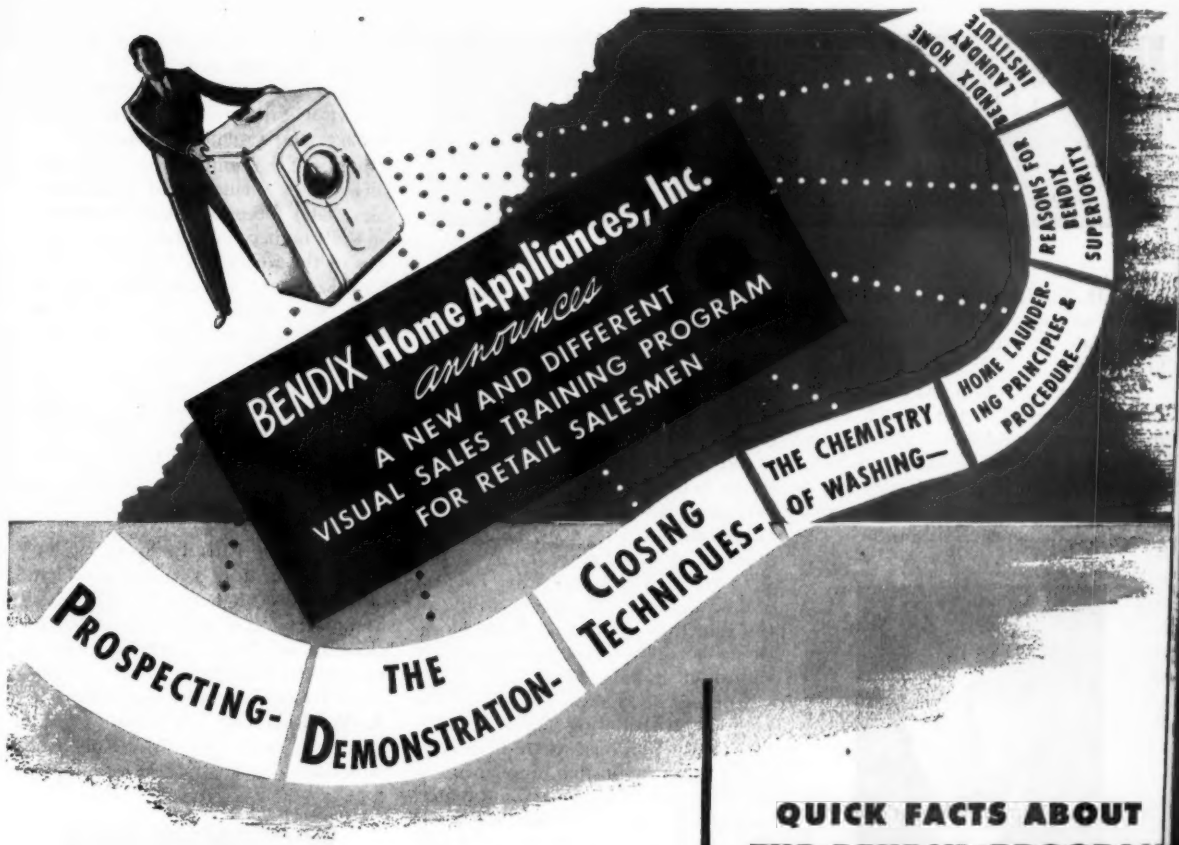
Included in the expansion are increases in the capacity of transmission lines, as well as the installation of new lines.

## ELECTRICAL PATENTS ISSUED AT RICHMOND

Electrical patents being issued at the Richmond patent office foretell the things to come to the postwar appliance dealer. The last week in May patents were granted for a mattress for treating human body ailments by heat therapy; a design for a luminous light switch shield; a combined telephone desk stand and hand set.

## OFFICERS FOR ELECTRICAL LEAGUE OF RICHMOND

New officers for the Electrical League of Richmond are A. B. Schad, president; A. T. Hove, C. & P. Telephone Company, vice-president; M. D. Tetterton, Virginia Electric & Power Company, treasurer, and Walter C. Cottrell, secretary.




## Training thousands of new retail salesmen quickly, thoroughly...speedily making them capable salesmen for BENDIX dealers...

Looking into the postwar future, Bendix announces one of the most thorough and modern training programs in the industry!

A COMPLETE COURSE in Bendix Automatic Home Laundry selling to enable key retail salesmen to be trained quickly by visual methods—so that they may return to their distributor and dealer territories, and train others by the same tested methods.

EVERY PHASE of Bendix selling will be covered by the latest methods, developed and proved by the Army, in its mass training programs: through demonstration, illustrated chart presentations, dramatized sales skits, sound slide films, chalk talks and actual student practice.

YOU PROFIT through the acquisition of new, yet thoroughly trained sales personnel. Men who have had little or no sales experience can readily sell the famous Bendix Automatic Home Laundry after passing this complete training course.

NOT ONLY SALES TECHNIQUE, but the story behind Bendix, the market for "washers," the chemistry of washing, manufacture, home service, advertising and merchandising, are covered in the Bendix sales program. It is complete in every respect—tested, streamlined, *PERFECTED TO TRAIN A MAXIMUM OF PEOPLE IN A MINIMUM OF TIME*—with complete Army principles and thoroughness.

Full details will be available soon... through your distributor.

## QUICK FACTS ABOUT THE BENDIX PROGRAM

... Thousands of men will be trained t sell Bendix throughout the country. Dis tributor's Bendix sales managers. Dis tributor's Bendix wholesale men. Dealer Dealer's Salesmen. Utility Salespeople Department store salespeople.

... The Bendix Sales Program will pro vide every proved selling device: Visua training charts. Slide films. Training book lets. Demonstration charts. Presentatio books. Regular bulletin service.

... Training Distributor's exclusive Bendi specialists at the factory. Dealer's utili and department store personnel in th field. Continuous "refresher" courses, the field.

... The Bendix Sales Training Progra will start soon (Distributors will notify yo

... To make the people who sell the Be dix Automatic Home Laundry the be equipped and hardest selling army salesmen, in the entire home applian field.

BENDIX Home Laundry

Bendix Home Appliances, Inc., South Bend, Indiana,
Pioneers and Perfectors of the Automatic "Washer."

# PERSONAL NOTES
## About Men You Know

**W. H. Robinson, Jr.**, has just been named manager of G. E. Lamp Department's advertising division with headquarters at Nela Park, Cleveland.

In his new position, Robinson will serve as successor to the late **H. Freeman Barnes** who directed G-E's lamp promotion and advertising activities.

Robinson, in his early forties, has a twenty-year background of lamp and lighting experience. His business career is highlighted by a succession of advancements to a variety of positions he has held coast to coast with General Electric.

**W. H. Robinson, Jr.**

A native of Boston, he received his early schooling in suburban Somerville, Mass. He attended Massachusetts Institute of Technology where he received his Bachelor and Master of Science degrees.

He joined the street lighting division of General Electric at Lynn, Mass. in 1925. He engaged in special lighting sales work for G. E., in the period between 1925 and 1935, at Schenectady, in New York, in Chicago, and at Los Angeles.

In 1935, Robinson was appointed district engineer for G. E. Lamp Department's South Pacific sales district at Los Angeles. In the following year he was made supervisor of Hollywood studio lighting and lamp sales.

In 1939, Robinson was advanced to the post of assistant manager of the South Pacific sales district. Transferred to Nela Park headquarters in 1942, Robinson was put in charge of activities in the lamp department's war program of conversion from lamp making to electronic tube production for radar and other military needs. In May of this year, he was named sales manager of electric discharge lamps.

* * *

**S. F. Duggan** has been appointed to the post of general sales manager of the Deepfreeze Division of Motor Products Corporation, according to an announcement recently made by **G. H. Smith,** vice-president and general manager of Deepfreeze.

In his new position, Mr. Duggan will be charged with responsibility for the direction of sales of both Deepfreeze home freezers and Deepfreeze Industrial chilling equipment.

Coming to Deepfreeze from the C. & D. Distributing Co. of Charleston, South Carolina, where he was an active partner in that appliance enterprise, Mr. Duggan is intimately acquainted with all phases of appliance merchandising. Prior to this connection, he was manager of the Refrigeration Division of Edison G. E. Appliance Co., Inc. A graduate of Georgia Tech's School of Business Administration, Mr. Duggan brings to Deepfreeze an experience of over 16 years in the home appliance business.

* * *

**Frank R. Pierce**, former sales manager for the Frigidaire Division of General Motors, has been elected a vice-president of the corporation by the board of directors.

Mr. Pierce served with Frigidaire products for a number of years, beginning in 1921 when he became associated with the J. J. Pocock, Inc., Philadelphia, distributor for Frigidaire. He was with that firm for eleven years as stenographer, salesman, sales supervisor, sales manager, educational manager and general sales manager.

**Frank R. Pierce**

In 1932 he joined the Frigidaire Division as manager of household sales, later becoming sales manager. In 1939 he became general sales manager of the Kelvinator Division of the Nash-Kelvinator Corporation and in 1941 was named vice-president in charge of both refrigerator and automobile for that company.

He rejoined General Motors as manager of the Detroit office of Public Relations Department in July, 1944 and was assigned to the personnel staff in June, 1944.

* * *

Election of **Ellis L. Spray** by the board of directors as a vice-president of the Westinghouse Electric and Manufacturing Company in charge of elevator and air conditioning activities of the company at Jersey City, New Jersey, has been announced by **A. W. Robertson,** chairman.

At the same time, Mr. Robertson announced that the Westinghouse Electric Elevator Company is being dissolved as a corporate entity, and that activities formerly handled by the Elevator Company, which was a wholly-owned subsidiary of the Westinghouse Electric and Manufacturing Company, will continue as the Elevator and Air Conditioning Divisions of Westinghouse.

**E. L. Spray**

Until election to his new post, Mr. Spray had been vice-president and general manager of the Elevator Company. He began his career with Westinghouse in 1918 as an electrician's helper in the company's East Pittsburgh Works. He became works man-

THE ELECTRICAL SIDE OF

# Ventilation

FOR YOUR PLANT

FOR YOUR PRODUCT

For ventilating essential plant operations, Graybar can supply everything you need — from wall fans to large centrifugal types. A Graybar Man in your area is ready to give you or your contractor experienced aid in applying them to remove stale air, fumes, dust, or excess heat from a single room — or to ventilate an entire building.

For products requiring built-in air circulation, Graybar can supply suitable ventilating apparatus and components. Check with Graybar for motors, switches, controllers, wire and cable, and all your other electrical needs. *Graybar Electric Company, Graybar Building, New York 17, N. Y.* 4534

*Via GraybaR*
*...the Double-Duty Source of Supply*

IN OVER 80 PRINCIPAL CITIES

Famous
CHROMALOX
Tubulars

*Fast! Easy Cleaning! Long Life! Economy!*

EASY TO INSTALL ON ANY MAKE AND SIZE ELECTRIC RANGE

CHROMALOX Range Units with Snap-on Adaptor rings FIT ALL RANGES. No adjustments are necessary. Minimum of manpower, time and tools needed for servicing.

Insure your customers perfect fit in any range replacement. Give them CHROMALOX and win their lasting goodwill.

Famous CHROMALOX Tubulars will be available as soon as their vital materials are released from war-work. Meanwhile—CHROMALOX Superspeed and Heatflo units for all ranges are available now.

B. Rosen, 1000 Peachtree St., N.E., Atlanta, Ga.
R. Ward Co., 403 Southland Building Annex, Dallas 1, Texas
932 M & M Building, Houston 2, Texas
R. Phillips, P. O. Box 2561, Raleigh, N.C.

for new ranges and for replacement

CHROMALOX
designed for
FASTER, BETTER Cooking

Cutaway of Inconel sheathed tube shows the exclusive CHROMALOX design which gives maximum contact cooking surface.

*Edwin L. Wiegand Co.*
7600 Thomas Blvd.
PITTSBURGH 8, PENNA.

CHROMALOX
means *"Electric Cooking at its Best"* RC-6


ager at the Westinghouse Mansfield, Ohio, plant in 1922 and was appointed works manager at Jersey City in 1929.

* * *

**Dean Spencer,** who has been identified with the Norge line of household appliances for the last 14 years, has been appointed southeast regional manager of the Norge division of Borg-Warner Corp. and will have his headquarters in Atlanta, Ga., it was announced by **M. G. O'Harra,** vice-president and general sales manager.

Spencer has been field service superintendent since 1942 and was in charge of service operations in New York and Chicago. His first affiliation with the line was in 1931 when he joined the Norge distributor in Oklahoma City, Okla., to work in the dis-

**Dean Spencer**

tributor's department. In 1939, he entered the employ of Norge as field service representative, in which position he travelled extensively and became well known to southeastern distributors and dealers as well as others throughout the nation. He served as washer specialist just before the war.

As regional manager he will be responsible for Norge distribution in territories of Charlotte, N. C., Charleston, S. C., Atlanta, Ga., Jacksonville, Fla., and Johnson City, Chattanooga and Knoxville, Tenn.

* * *

**L. L. Ferree,** former president, general manager and a director of the Gulf Public Service Co., Inc., with general offices in New Iberia, has resigned as of June 1, and has retired from active service. Mr. Ferree has lived in New Iberia for the past fifteen years and was identified with this company during that time.

The retiring head of the firm will be succeeded by **C. J. Schexnayder,** who assumes the title of general manager and vice-president. Mr. Schex-

# Pacemaker!

## BULLDOG
## INDUSTRIAL TROL-E-DUCT
### *Moves the Power with the Load*

When power is needed for portable tools, it's there — right overhead. And it moves right along with the job.

BullDog Industrial Trol-E-Duct saves you money — does away with expensive installations of fixed wiring and the dangers of long, trailing cables. Completely enclosed, it guards your workers against accidental contact with "live" parts.

This safety feature also makes it an ideal electric feeder for Cranes and Hoists.

Industrial Trol-E-Duct gives you a flexible system — sections can be added any time you want to expand or change your shop set-up. And the whole system can easily be moved anywhere in your plant. It is 100% salvable, too — nothing to scrap.

Single Phase or Three Phase, AC or DC — 575 Volts or Less.

For nearly half a century, we have been "pacemakers" in electrical distribution systems. We invite you to consult expert BullDog field engineers about the power problems in your plant. Or write us for descriptive folders.

BUY WAR BONDS

# BULLDOG

ELECTRIC PRODUCTS COMPANY

Box 177, R. Pk. Annex
Detroit 32, Michigan

Field Engineering Offices in All Principal Cities.

Also Manufacturers of Vacu-Break Safety Switches — SafToFuse Panelboards—Switchboards—Circuit Master Breakers—BUStribution Duct, for "plug-in" power—Universal Trol-E-Duct, for flexible lighting.

THERE'S ONLY ONE MOVING PART IN
and that part moves on BALL BEARINGS!
Federal NOARK MAGNETIC MOTOR STARTERS
Get that? Ball bearing action! The biggest single feature of starters and contactors—and you'll find it exclusively in Federal Noark Controls. You'll find the bearings smoothly, quickly and accurately locating and guiding the entire assembly. You'll find friction (always present where there is motion) reduced to an extremely low point. Study the illustration carefully. This is only ONE of Federal's many superior features. Contact your local Federal Field Engineer. He'll show you this and many other exclusive features of Federal Noark Controls. Do it today!
FEDERAL ELECTRIC PRODUCTS COMPANY, INC.
Executive Offices: 50 Paris Street, Newark 5, New Jersey • Plants: Hartford, Connecticut; Newark, New Jersey
Manufacturers of Motor Controls • Safety Switches • Circuit Breakers • Service Equipment • Panelboards
BALL BEARINGS
The section in red represents the only moving part of the Federal Noark Magnetic Motor Starter. Simplicity itself!

nayder is a native of New Iberia and has been associated with Gulf Public Service since 1926.

Mr. Ferree has been associated with utility companies since 1902, having been connected with the Newport Electric Co.; Portang Electric Co., of Harrisburg, Pa.; Harrisburg Light & Power Co.; Salem Electric Co., of Salem, Ohio; and Georgia-Alabama Power Co. Later in 1925 he was made general manager of the Southwestern Public Service Co., with headquarters in Amarillo, Texas, which position he held until he was transferred to New Iberia, June 1, 1930, as general manager and director. In 1942 he was made president of the Gulf Public Service Co.

* * *

**Robert M. Oliver,** vice-president in charge of sales for the Proctor Electric Company of Philadelphia, manufacturer of the Neverlift iron, announces the appointment of **Walter H. Kelly** as Baltimore District manager. Mr. Kelly's territory consists of Maryland,



**Walter H. Kelly**

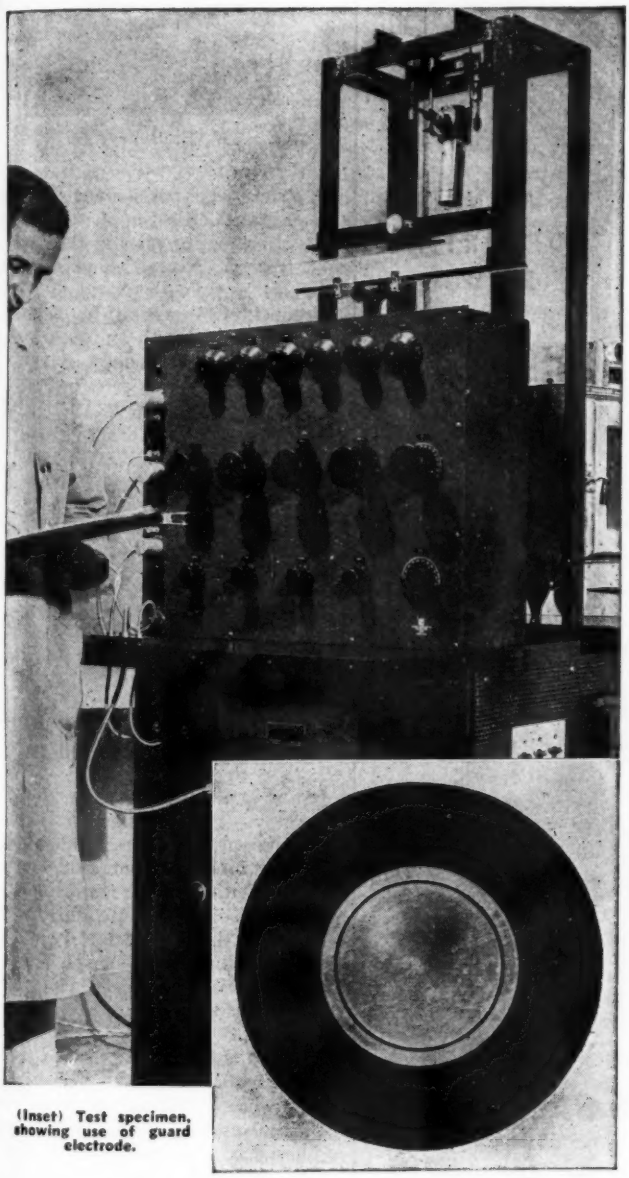
District of Columbia, Virginia and the eastern half of North Carolina.

For seven years prior to the war Mr. Kelly was associated with the retail appliance field, but after Pearl Harbor he joined the armed forces of the United States Coast Guard and served two years in the cutter service. Mr. Kelly will work under Major Oswald MacCarthy recently appointed Eastern sales manager for the company.

* * *

**H. E. (Ervin) Cole, Jr.,** has been appointed field engineer and representative for the National Electric Products Corporation, according to announcement by **W. E. Henry, Jr.,** southeastern district manager, of Atlanta, Ga. Mr. Cole is a graduate of the State College of North Carolina,

# SERVICE!



(Inset) Test specimen, showing use of guard electrode.

***DOLPH Research and Testing Facilities Include Equipment to Determine Power Factor and Dielectric Constant of Insulating Varnish.***

Data on dielectric constant and power factor of insulating varnish and insulating materials has long been of importance in the electrical field. Realizing this, the JOHN C. DOLPH COMPANY installed a Leeds and Northrup high voltage modified Schering Bridge. This measuring equipment is noted for its high degree of precision and is designed primarily for use on frequency of sixty cycles. The power factor of the specimen is read directly at this frequency on most materials. Operation can be effected up to a maximum voltage of 10 K.V.

Determination of dielectric constant and power factor is obtained while the specimen is under a voltage stress, thereby simulating actual operating conditions. This data is obtained with the highest possible degree of accuracy by the use of guard electrodes. (See Illustration.)

**TWO PURPOSES SERVED**

***Production Check*** Any variations in quality due to improper processing of the varnish or variations in the raw materials used in formulations, can usually be detected through dielectric measurements.

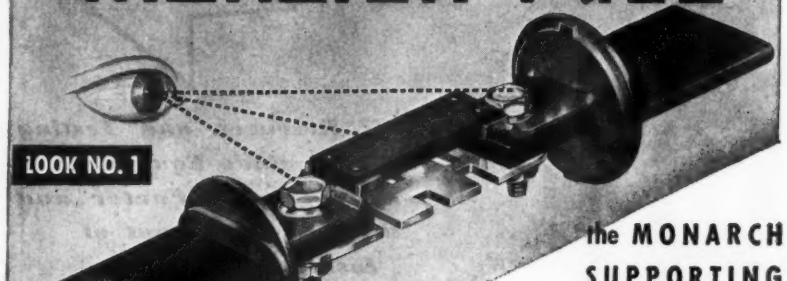
***Further Research*** Today, electrical manufacturers are seeking pertinent information on the electrical characteristics of insulating varnish films. We, of the JOHN C. DOLPH COMPANY, are now in a position to handle requests of this nature and we make this service available to you without any obligation on your part. Send us your inquiries and we will be glad to furnish you with the desired information.

*Insulating* Dolph's *Varnish Specialists*

**JOHN C. DOLPH COMPANY**

**168 EMMETT STREET • NEWARK 5, N. J.**

# Take a TWO-WAY LOOK AT THE Monarch Fuse

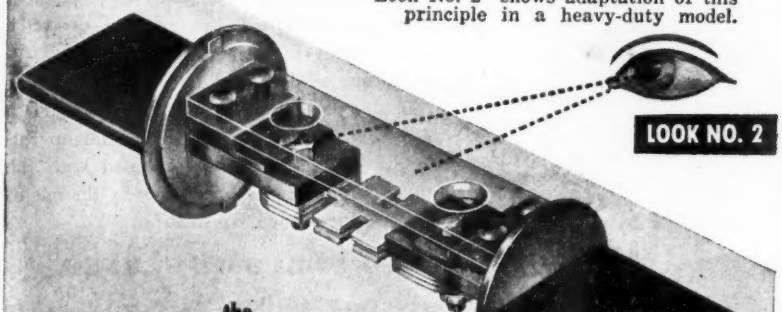


LOOK NO. 1

the MONARCH SUPPORTING BRIDGE

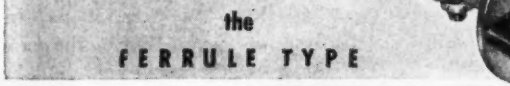
Note how this Monarch construction prevents the fibre bar from coming in direct contact with the screw connecting renewal link to knife blade. This minimizes the charring of the fibre bar and positively prevents excessive overheating of knife blades. Note also large metal parts which dissipate heat. Result: *dependable protection.*

"Look No. 1" illustrates this construction in a lighter-duty Monarch knife-blade fuse and "Look No. 2" shows adaptation of this principle in a heavy-duty model.



LOOK NO. 2

the FERRULE TYPE



*Specify* Monarch Fuses *for improved* FUSErvice

Monarch RENEWABLE Fuses

MONARCH FUSE CO., LTD.
118 E. FIRST ST., JAMESTOWN, N. Y.

**W. E. Henry, Jr.**

at Raleigh. He was associated with the General Electric Supply Corporation for a number of years in the branches at Raleigh, Norfolk, and Charlotte. In his work with National Electric Products Corporation he will cover the states of North and South Carolina and Eastern Tennessee.

**H. E. Cole, Jr.**

National Electric Products Corporation now has four field engineering representatives in the southeastern district. The others and the territory they cover are: L. A. Roach, Virginia and Eastern North Carolina; H. H. Milligan, Florida; and H. H. Holt, Georgia.

* * *

**H. M. Lupton, Jr.**, formerly active in New York advertising agencies, and president of Lupton, Reed and Co., Inc., advertising and marketing counselors, has been appointed advertising manager of the Electric Power Board of Chattanooga.

* * *

**E. Jack Hogsed**, who recently joined the **W. Bert McDonough** organization, Atlanta, Ga., as a representative, has established his headquarters in Birmingham, Ala.

The McDonough organization is a manufacturer's agency selling to hardware, electrical, mill supply and automotive jobbers.

## New Electrical Books

### Electrical Power in Marine Service

**By J. M. Dobbs. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N. Y. 458 pages, illustrated. Price $4.00.**

This volume, number two of the "Marine Electricians' Library," covers machines and devices involved in the generation and distribution of electrical power in shipyards and aboard ships. The size and limitations of the electrical machine are discussed, with emphasis on the importance of the air gap in all electrical mechanical machines. This book covers a-c and d-c generators, their characteristics, the d-c commutator and the phenomenon of commutation in general, the switchboard, its operation and management, and parallel operation of direct- and alternating-current generators.

---

### Power System Stability

**By Selden B. Crary. Published by John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N. Y. 291 pages, illustrated. Price $4.00.**

This is the first of two volumes providing the fundamental theory underlying maintenance of continuous electric power under normal and abnormal operating conditions.

Two volumes have been written to bring to engineers, and the designers of power apparatus, the modern theory of stability with data and applications of power system design and operation.

This first volume includes discussions of such fundamental subjects as power flow, synchonous machine power angle characteristics, stability limits, composite systems, equivalent reactance of synchronous machines, long distance power transmission, system design and related subjects.

Volume II, now in preparation, will provide the essential theory underlying Transient Stability and its relation to system design. Together these two volumes will furnish up-to-date information and accurate reference data for operator and designer when confronted with major or minor power system problems.

---

### Color Television in 1941

Color television first was put on the air in 1941 from the New York skyscraper, the Empire State building.


*What to use . . .*

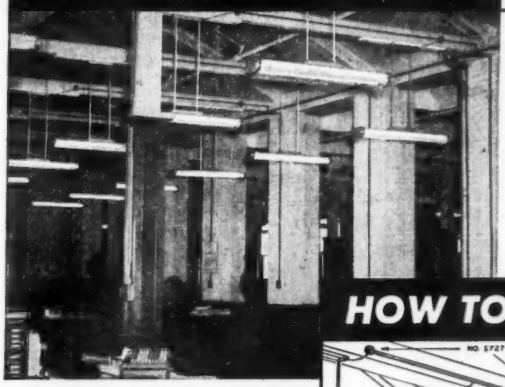
for convenience, economy, efficiency . . . in the installation of modern lighting systems, whether incandescent, fluorescent or newly developed light sources are specified.

**WIREMOLD** *surface*

**METAL RACEWAYS**

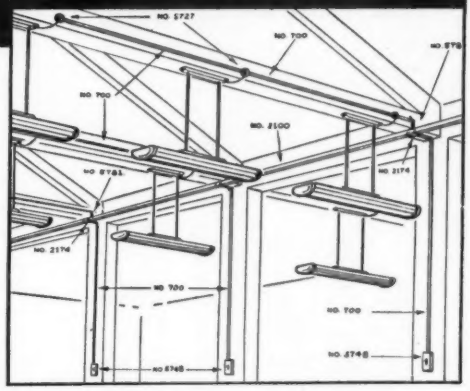
A complete series of basic surface raceway wiring systems . . . each with its own range of installation fittings . . . interconnectable one with another and with already installed wiring.

**WHERE TO USE IT . . .**



In this photograph is shown a typical use of Wiremold 2100 and 700 raceways with their installation fittings in wiring a building of mill type construction for fluorescent lighting units. Note the wide adaptability of Wiremold in handling a difficult ceiling installation and the convenient arrangement of switch controls on the building columns.

**HOW TO USE IT . . .**




Diagrammatic drawing shows the fittings used in this type of installation and emphasizes the interconnectability between the different sizes of raceway, which is an important feature of Wiremold. By using the various sizes of Wiremold raceways, interconnecting with each other and with existing wiring installed in the building, it is possible to plan a complete wiring layout from panelboxes to outlets with maximum economy in material and in time of installation. Write to The Wiremold Company, Hartford 10, Conn., for a copy of the Wiremold Catalog and Wiring Guide #16A and Engineering Data Sheets covering this type of installation.

**THE WIREMOLD COMPANY**
**HARTFORD 10, CONN.**

**ELECTRICAL CONTRACTORS . . .**

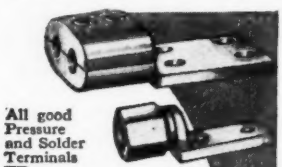
Business publications like these, with aggregate circulation of over 240,000 monthly among your prospects and customers, carry Wiremold advertising messages designed to HELP YOU BUILD BUSINESS. Tie in with this aggressive promotion program.

NEMA **KNOW YOUR WIREMOLD**

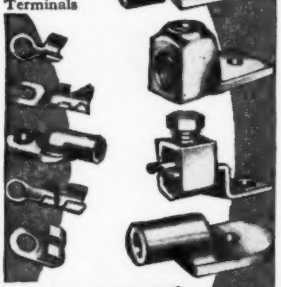
BUSINESS BUILDER IN TOMORROW'S MARKET FOR ADEQUATE WIRING

You always find the
**EXACTLY RIGHT**
Terminal Lug—

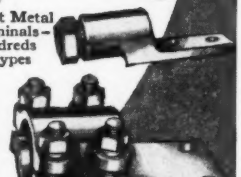
**in the COMPLETE line**
You'll see ALL good types of terminals in the Penn-Union Catalog. Shown above is the EZ; below are a few pictures giving an idea of the wide variety:



All good Pressure and Solder Terminals



Sheet Metal Terminals—Hundreds of Types



Also Tees, Taps, Straight Connectors, Grounding Clamps, etc., etc., thousands of items. And every one is Dependable, mechanically and electrically. Penn-Union fittings are the first choice of experienced users.

L. MORRIS LANDERS
315 Walton Bldg. ATLANTA, GA.
WALTER J. HUEMMER
Dallas Transfer & Terminal Warehouse Bldg. DALLAS, TEXAS
PENN-UNION ELECTRIC CORPORATION
Erie, Pa.

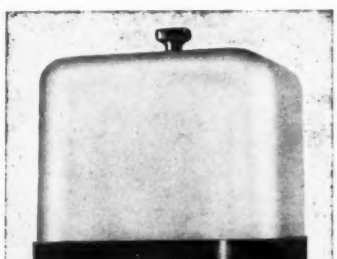
**PENN-UNION**
Conductor Fittings

# NEW EQUIPMENT and MATERIALS

### ELECTRESTEEM STERILIZER

Mother's problem of baby bottle sterilization is met with the newly introduced unit of the Electric Steam Radiator Corporation, of Detroit, Michigan.

The firm presents a modernly designed sterilizer which holds a 24 hour supply of milk bottles, an orange juice and one water bottle. Of plastic

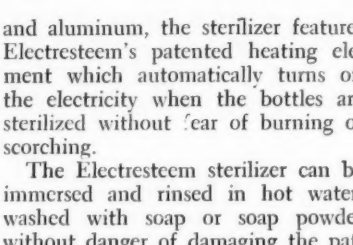


and aluminum, the sterilizer features Electresteem's patented heating element which automatically turns off the electricity when the bottles are sterilized without fear of burning or scorching.

The Electresteem sterilizer can be immersed and rinsed in hot water, washed with soap or soap powder without danger of damaging the patented foolproof heating element.

### PERMAFLECTOR LUMINAIRE

The Pittsburgh Reflector Company, Oliver Building, Pittsburgh 22, Pennsylvania, announces the A-3440 Permaflector fluorescent luminaire. This luminaire is one of several currently being announced in the A series of units. This shielded type 4-40 watt fluorescent luminaire is a combination of engineered lighting with beauty of design. Satinol finished contrasting glass panels add to the beauty of design and are easily removable for maintenance. Lighting is controlled; maintenance is simple; mounting is flexible, and they may be individual, continuous, direct ceiling or suspension mounted.



### BURKE TERMINAL BLOCKS

A new booklet is available from the T. B. Burke Electric Company, Erie, Pa., describing 10 styles of Controlead terminal blocks. Originally developed for central station and substation control cable connections, these are now widely used as junction points in any control wiring installation. The booklet includes listings of styles, cross section views, dimensions and prices.

HELWIG SPEER
Carbon Products

**Multiflex Brushes**
*Give*
Better Commutation
Longer Life
Less Commutator Wear
That Extra Demand Required
Better All Around Performance
*KEEP THE BONDS YOU BUY*

**HELWIG COMPANY**
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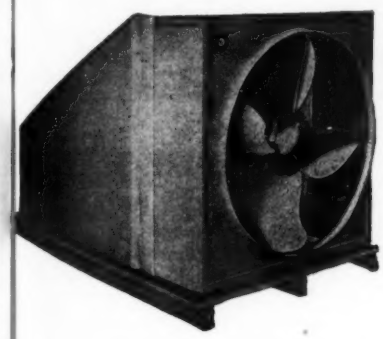
*Southern Offices:*
323 Northwest Second St.,
Oklahoma City 2, Oklahoma
3000 Block McKinney, Houston 3, Texas
1913 Washington Avenue, St. Louis 3, Missouri

### CHELSEA COMFORT COOLERS

A comfort cooler fan designed especially for homes, churches, schools, hotels and hospitals, and available in two types, is described in Bulletin No. 801-B, issued by the Chelsea Fan & Blower Company, Irvington, New Jersey.

Among the outstanding features of the comfort cooler are: new streamline venturi orifice, greater volume; certified ratings, as per the ASH&VE method; efficient fan duty motors, low



current consumption; die stamped blades, precision balance and alignment; moving parts rubber cushioned, quietness; ball bearing on fan shaft, long life and little attention; faultless all steel construction, stability.

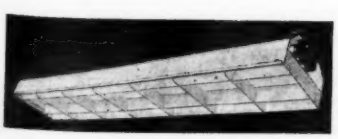
Type ED comfort cooler is built in a self-supporting frame, making installation easy. Frame and orifice are stamped out of one sheet of steel making a rigid sturdy unit, yet light in weight. Fans are shipped completely assembled with motors detached.

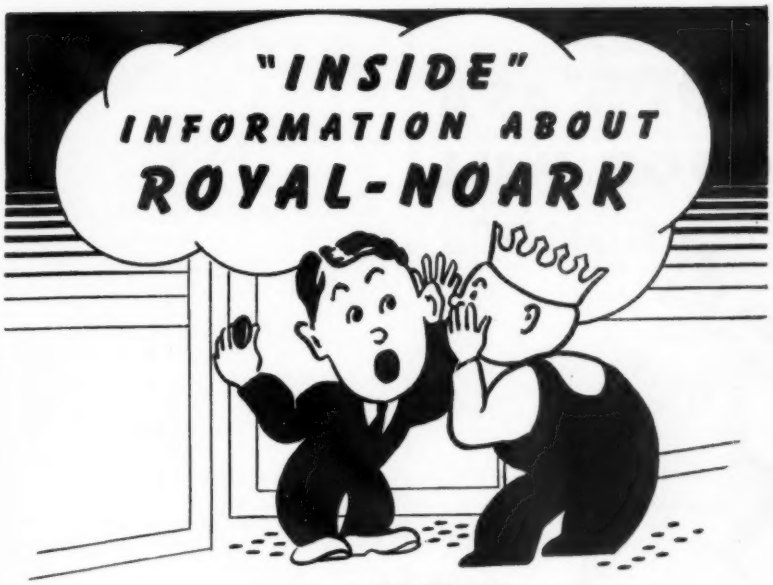
Type EU package unit is a complete comfort cooling installation. It consists of an ED type fan in a square housing, plenum chamber, canvas boot, electric control with fuse link that turns off motor in case of fire, and an automatically closing ceiling shutter. Plenum chamber is shipped unassembled.

### CURTIS FLUORESCENT UNIT

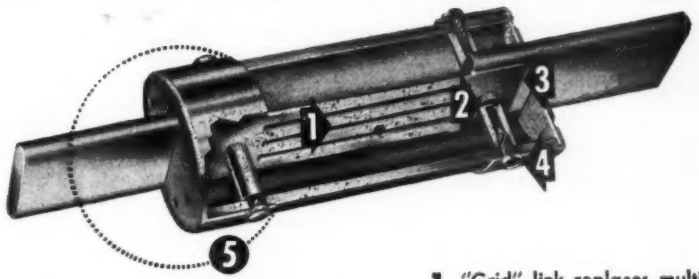
A new type fluorescent unit which is an industrial unit and can also be used as an exposed troffer in certain factory office and drafting room installations has been announced by Curtis Lighting, Inc., 6135 West 65th St., Chicago 38, Ill.

The primary purpose of this unit is to illuminate areas where long, con-




THE NEW
ROYAL-NOARK Non-RENEWABLE FUSES
ARE 5 WAYS BETTER...ON THE INSIDE!




They stay cooler... give greater protection to vital equipment!

1 "Grid" link replaces multiple links

2 Cross-bar anchors link and blade

3 Flow-solder contact merges link and blade into one element

4 Stud riveted into cross-bar locks all parts into single, firm unit

5 Rigid girder assembly cannot turn, twist, or loosen

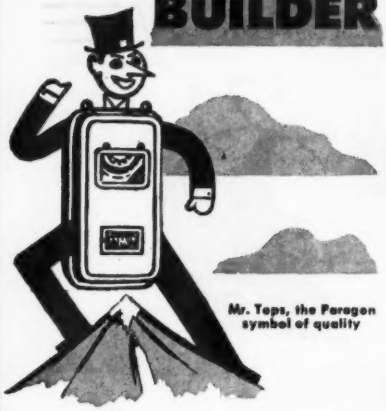
WRITE TODAY FOR NEW CATALOG

ROYAL

WIRE • CORD SETS • CARTRIDGE and PLUG FUSES • FUSTATS • TROUBLE LIGHTS • CHRISTMAS LIGHTING SETS

ROYAL ELECTRIC CO., Inc., PAWTUCKET, R. I.

# "TOPS" AS A GOOD WILL BUILDER



Mr. Tops, the Paragon symbol of quality

300 Series

Paragon time switches and industrial timers win friends and satisfy customers. They insure top quality installations. Use them on your next job.

***Only $13.00 List***

300 Series self-lubricating time switches are accurate and durable for controlling stokers, oil burners, blowers, pumps, valves, air conditioning, etc. America's leading time switch value.

800 Series

***Time Delay Relays***

The time cycle of Paragon synchronous motor operated, instantaneous reset, type relays is unaffected by vibration or changes in ambient temperature. For motor and tube protection.

700 Series

***7-Day Time Switches***

. . . are designed for presetting heating or ventilating schedules on a weekly basis with independent daily operations.

***Manually Preset Timers***

The 2500 series is designed to close or open a circuit at the end of a preset interval, such as attic fan control.

Send for complete bulletin. All these units are designed and built by a pioneer in the automatic timing field.

2500 Series

**PARAGON ELECTRIC CO.**
713 OLD COLONY BUILDING
CHICAGO 5, ILLINOIS

Paragon Chicago
BUILDERS OF ELECTRICAL EQUIPMENT SINCE 1903


tinuous lines are to be used as over benches where precision work is to be done. It is available with or without louvers. The louver is exceptionally practical and of substantial all steel construction and provides 25° crosswise and 15° lengthwise shielding. The louvers are supported at four points and may be swung down for maintenance. These units can be hung individually or in continuous lines by means of chain, conduit or cable.

This new unit is 48 inches long, 11¾ inches wide and 7⅝ inches high to top of ballast. It is wired for 110-125 volts a-c, but can be furnished for 220-250 volts on request.

### CORY SALES CAMPAIGN

Powerful promotion of iced coffee will feature this summer's advertising of the Cory Glass Coffee Brewer Co., with full color advertisements appearing in leading general service and women's magazines during July and August.

The ads will feature color photographs of the Cory glass coffee brewer surrounded by "tall, dark and delicious" glasses of iced coffee in an inviting garden setting. Copy extols the delights of iced coffee as a delicious, refreshing beverage, and advises that the best iced coffee must be made strong, and made right. A special plug is given the patented Cory glass filter rod, which "filters coffee only through coffee."

The coffee industry anticipates that the Cory campaign will give valuable support to the industry-wide summer promotion of coffee, hot or cold, as a summer beverage.

### EUREKA ATTACH-O-MATIC

Eureka Vacuum Cleaner Company will introduce a newly-perfected and exclusive attach-o-matic device which makes possible the interchange of various new cleaning devices with its "postwar" upright vacuum cleaner, according to H. W. Burritt, president.

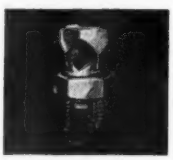
The unit, which will become an integral part of Eureka's complete home cleaning system, will be produced as soon as war conditions allow and manpower and materials are available.

Developed by the Eureka engineers, the device can be fitted into the motor compartment of the upright cleaner. Making direct contact with the motor, the attach-o-matic automatically disconnects the rotary brush belt and shifts suction power to the device itself. When removed, the brush belt automatically reconnects.

When the cleaner's flexible hose is connected to the attach-o-matic, additional cleaning tools may be employed, including a dusting brush, sprayer, demother, crevice tool or the floor and wall brush.

### PF CORRECTION CHART

A useful, time-saving chart has been devised by Cornell-Dubilier Electric Corporation engineers for quickly determining the capacitor KVAR re-

*Ilsco*
**Electrical Connectors**

**WHAT WE SAVE IN WEIGHT YOU SAVE IN COSTS**

Most value per dollar . . . most service and satisfaction. Figure it out . . . you're way ahead because ILSCO PRODUCTS are

*12% cooler*
*50% lighter*
*75% lower price*
*99% pure electrolytic copper*
*100% conductivity*

WRITE FOR 32-PAGE ILLUSTRATED CATALOG.

*Southeastern Representative*
**VERLYN H. BRANHAM**
180 Interlochen Drive, N. W.
Phone CHerokee 5256
ATLANTA, GA.

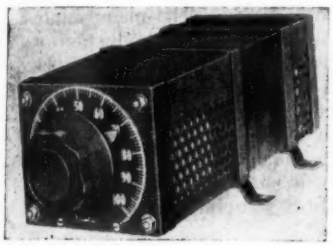
ILSCO COPPER TUBE & PRODUCTS, Inc.
CINCINNATI, OHIO

quired to increase power-factor to any desired value. The chart is extremely simple to use. On the reverse side of the chart are tables on the effect of improving power-factor on a 3-phase circuit in conduit, also useful capacitor application formulae.

Copies of the chart may be obtained free on request to the Power-Factor Capacitor Division, Cornell-Dubilier Electric Corporation, South Plainfield, New Jersey.

### GULOW VARI-FORMER

The Gulow Vari-Former, made by the Gulow Corporation, 26 Waverly Place, New York City, offers extreme flexibility in a-c voltage control. Voltage is continuously variable without circuit interruption from zero to maximum values. A self-aligning solid sil-



ver contact, finger-tip controlled by a single knob switch, provides a small increment voltage change throughout the range of the device. No carbon brushes are used. Incremented increase is in the order of 0.75 volts or less.

Gulow units are supplied either with auto-transformer winding or separate windings for isolation of circuits. Available for one or three phase use with single control. Class "A" or "B" insulation optional. Sizes and ratings, as well as an informative bulletin, will be furnished on request on company letterhead.

### WIREMOLD ELBOWS

The Wiremold Company, Hartford 10, Conn., manufacturers of surface metal raceways and fittings for electric lighting, power, telephone and signal system wiring, announces an important design improvement in the construction of No. 3011 and No. 3018 elbows for use with No. 3000 Wiremold raceways. The new design eliminates all sharp corners in the interior of the elbow, presenting smooth, rounded surfaces for the raceway, and eliminating danger of abrasion of insulation on conductors.

This same effect has been accomplished in the No. 3017 by providing the elbow with a cover.


Collyer

HEAVY DUTY RUBBER SHEATHED

Portable Cable

Hard blows, reeling and unreeling, heat and abrasion are all in the day's work for Collyer Heavy Duty Rubber Sheathed Portable Cables. On cranes, elevators, electric shovels; for conveyors, dredges and excavating machinery — wherever abrasion, oil, grease and chemicals destroy ordinary cables—Collyer Rubber Sheathed Cables provide dependable, reliable service. Available in Single and Multi-conductor, Type W, Type G and other special constructions.

NOTE THESE OUTSTANDING FEATURES

1 Rope-stranded, tinned copper wires for desired flexibility...resist both tension and torsion.

2 Heat-resistant synthetic rubber insulation...safe for heavy overloads.

3 Multiple conductors cabled with jute fillers...flexible, easy to handle.

4 Rubber cushioning belt, highly resilient, with reinforcing open twine braid.

5 Lead-cured neoprene rubber sheath—dense, tough...resistant to flame, chemicals, oil and physical abuse.

*Let us know your requirements.*

Collyer INSULATED WIRE CO.

Southeastern Sales Representative: FULWILER & CHAPMAN, ATLANTA, GA.

**JUST A HANDFUL of T&B LOCK-TITE* PRESSURE CONNECTORS**

**That is all you need for most lugging and tapping on maintenance, repair, construction or change-over wiring jobs.**

**Each Lock-Tite Connector takes several overlapping cable sizes up to 1000 MCM, and handles any type of cable—solid, stranded, flexible, extra-flexible, hemp-core, rod or tubing.**

**Being solderless, T&B Lock-Tite Connectors are easy and quick to install. Being T&B engineered, they resist vibration. Being salvageable, they can be used over and over again.**

**Of course you want Connectors, approved by Underwriters Laboratories, that are electrically and mechanically correct. Order an all purpose assortment of T&B Lock-Tite Connectors from the stock of your nearest T&B Electrical Distributor.**

**Under the T&B 100% Distributor Plan, all T&B products are sold exclusively through the competent service organizations of T&B Electrical Wholesalers.**

*Trademark Reg. U. S. Pat. Off.

***Write for NEW Lock-Tite Connector Folder for all the dope on this Lock-Tite line.***

The Thomas & Betts Co.,
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Room 423
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Charlotte, North Carolina

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Incorporated
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T&B

**THE THOMAS & BETTS CO.**
INCORPORATED
manufacturers of electrical fittings since 1898
ELIZABETH, 1, NEW JERSEY
In Canada, Thomas & Betts Ltd., Montreal


### TELECHRON SELECTOR

The "Selector"—an electric alarm clock which will awaken the soundest sleeper to the strains of radio music, turn the radio on for selected programs throughout the day or night, and automatically switch the set off upon retiring—heads the list of postwar products developed by Warren Telechron Company, Ashland, Mass.

Besides automatically turning on the radio, the "Selector" can be used for starting a coffee percolator at a given time, switching household lights on and off, timing roasting operations and defrosting refrigerators. Due to its switch mechanism rated up to 1650 watts, it will time and control any household appliance which can be plugged into a conventional outlet.

First in a series of Telechron specialty clocks which will feature new awakening methods and perform many new timing functions, the "Selector" will retail for approximately $10. It will be made available to the postwar buying public through Telechron's regular distribution outlets.

### BULLDOG SWITCHES

The Bulldog Electric Products Co., 7610 Jos. Campau Ave., Detroit 32, Mich., have just published their latest condensed catalog, No. 451, on safety switches, light and power panel boards, switchboards, and bus duct systems. Copies of the catalog are available upon request.

### LIGHTING BOOKLET

A new lighting products booklet containing useful information for industrial and commercial users of lighting is available from Sylvania Electric Products, Inc., 60 Boston St., Salem, Mass., on request. The booklet contains comprehensive information about industrial, commercial, portable and inspection of fluorescent fixtures; fluorescent lamps, starters and lamp holders. Incandescent types listed include daylight lamps; large wattage lamps; vibration and rough service lamps; 3-light lamps; floodlight and spotlight lamps; tubular lamps, lumline lamps; sign and decorative lamps; and those for 6, 12 and 30-volt service.

### CIRKLAIR ATTIC FANS

Announcement received from The Folsom Co., Dallas, Texas, advises that there will be a limited production of both attic fans and circulating air fans of the well known Cirklair brand. The authorities have given The Folsom Co. approval of production of limited quantities of both types of fans.

For the past four years, The Folsom Co. has devoted its manufacturing facilities entirely to production of war material. During this period, The Folsom Co. purchased a factory building that provided many times the area formerly occupied. The larger space made possible the addition of much equipment, and provided other needed facilities for more and better production.

**INSULATED BUSHINGS**

**CONDUIT TYPE B,** with bakelite molded into a malleable iron casting to insure against grounds.

**SET-SCREW TYPE SB** for use with threadless conduit are securely fastened by case-hardened cup point set screws.

**THIN WALL TYPE SBT** similar in design to type SB for use with thin wall conduit (E.M.T.).

**GROUNDED TYPE BL** combines an insulated bushing with a combination lug for making a quick positive ground connection.

**SPECIAL BAKELITE TYPE BB** for use with cables passing through standard conduit knock-outs in metal boxes or troughs.

**O. Z. ELECTRICAL PRODUCTS**
Conduit Fittings
Cable Terminators
Junction Boxes
Solderless Connectors
Power Connectors
Grounding Devices

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8035

### ELECTRONIC HEATERS

Application of Allis-Chalmers vacuum tube electronic heaters for both induction heating of metals and dielectric heating of non-metallic materials is explained in a well-illustrated, fully descriptive, 4-page bulletin issued by the Allis-Chalmers Mfg. Co.

How the two types of heating work and the advantages of each are clearly pointed out, and numerous successful applications are indicated. Illustrations of typical production set-ups of the standard 20 kw heater are included.

The bulletin, B6372, may be obtained by request from Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

### REINFORCED BUS STRUCTURE

A new publication No. 4504, issued by Delta-Star Electric Company, 2400 Block Fulton Street, Chicago 12, describes and pictures reinforced high voltage bus structures to withstand short circuit stresses where currents of several hundred thousand amperes are a possibility. Copies are available upon request.

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## Maintaining Industrial Electrical Equipment

*(Continued from page 42)*

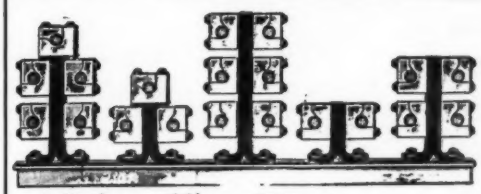
tion and oxidation or skinning. Periodic filtering or straining is desirable. Additions of thinner should be made slowly with constant stirring and with thinner at practically the same temperature as the varnish, especially in the case of synthetic-resin varnishes, so as to prevent the resin base from temporarily throwing out of solution or coagulating.

When mixed with air, vapors from solvents in varnishes are inflammable and explosive. They sometimes affect the nose and throat of persons in constant exposure to the fumes. Adequate ventilation should be provided both for treating and for baking to maintain the concentration of vapor below the explosive or toxic limit.

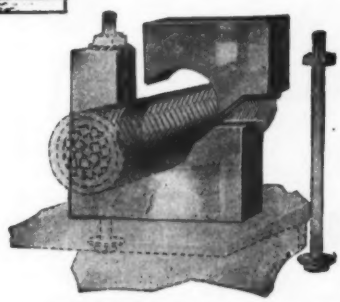
Infections of the skin sometimes occur when workmen have their hands and arms in frequent contact with varnishes or solvents. All possible safeguards should be used to eliminate any direct contact of wet varnish with the skin to avoid skin troubles.

To obtain the best results all surfaces to be coated should be clean, dry, and free from grease and dirt. Metal parts should be carefully pickled, or, if the presence of insulation prevents such treatment, thoroughly washed with a suitable solvent. Where a smooth finish is desired, nap may be removed from tapes or threads


"EFFICIENCY" DEVICES FOR CONDUIT AND CABLE SUSPENSION



EFFICIENCY NESTED CLEAT RACKS



● Simple . . . rigid . . . strong . . . features that have made EFFICIENCY Nested Cleat Racks the choice for efficient conductor mounting. The "nested" design permits cable suspension in a minimum space and at the same time speeds installation. A further aid to mounting convenience is the EFFICIENCY Time Saver Cleat, designed for use in conjunction with Nested Cleat Racks. Note, in the illustration, that the cleat is mounted permanently with one bolt, thus forming a solid support for the wire or cable. With this design the cable may be left to hang slack, or be drawn taut at the time of suspension. Using these units in combination *one man can install cable faster than two men with the usual type of cleats and racks.*

WRITE TODAY for our Catalog No. 388 . . . contains complete information on this and other EFFICIENCY Electrical Devices.

Efficiency ELECTRIC AND MANUFACTURING CO.

MANUFACTURERS OF EFFICIENCY ELECTRICAL DEVICES FOR CONDUIT, WIRE AND CABLE SUSPENSION

EAST PALESTINE, OHIO

M. & W. WATER-TIGHT RUBBER BUSHING TYPE CONNECTORS FOR SERVICE ENTRANCE CABLE

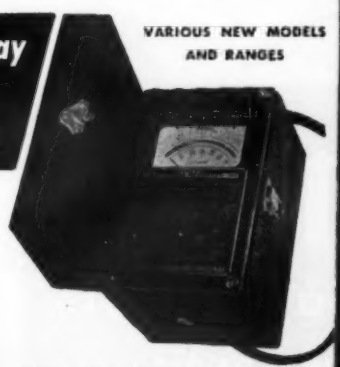
The design of the rubber bushing is such that it has a greater surface contact around the cable than the conventional bushing, assuring a water-tight fit around the cable.

*Send for Copy of Bulletin 14 which illustrates our complete line.*

THE M.&W. ELECTRIC MANUFACTURING CO., INC.
EAST PALESTINE ● OHIO

Test Insulation the Modern Way with a MODEL B-5 MEGOHMER

VARIOUS NEW MODELS AND RANGES



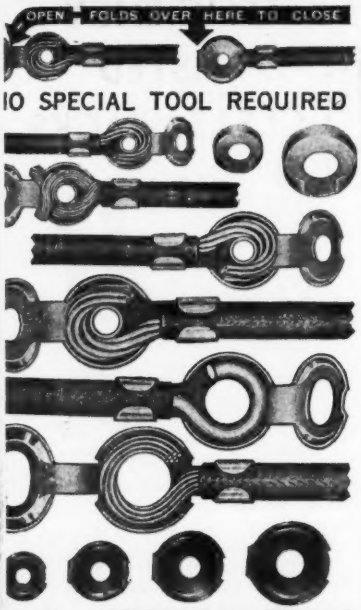
NEW BATTERY-VIBRATOR TYPE

*No more tiresome cranking of a hand-driven generator* . . . Entirely self-contained, steady test potential of 500 volts DC, available at the touch of a switch. Direct reading in insulation resistance

HERMAN H. STICHT CO., INC.
27 PARK PLACE NEW YORK, N. Y.

WRITE FOR BULLETIN No. 430

OLDING **DOUBLE** CUPPED
★ WASHER LUGS ★
SIZE and TYPE *for every need!*




WRITE FOR BULLETIN 8-DF
KRUEGER & HUDEPOHL
Solderless Terminal Lugs and Connectors
VINE AT THIRD—ES • CINCINNATI 2, OHIO

***Relax in Cool Comfort***

HOTEL
**Mayfair**
Saint Louis
AIR-CONDITIONED

by singeing. Any small particles on the work at the start may increase in size and become more unsightly after each varnish coat and succeeding baking operation.

**Temperature Control**

In so important a series of operations as applying and baking film insulation to armature and field coils, it is of the utmost importance that a sufficient temperature be maintained to thoroughly expel all solvent and moisture and to properly set the varnish film to a degree of hardness and permanence which will in no way be affected by subsequent service.

Insulating systems containing cellulose materials in the form of cloth, tape, twine, paper, etc., when treated with modern varnishes, can be safely subjected to baking temperature of 125 to 150C (255 to 300 F).

Electric or steam ovens properly designed should be used to provide for uniform temperatures, and ventilated to remove all solvent vapors.

If the process is correct, baking removes the last traces of solvents and moisture. With synthetic-resin varnishes, baking promotes the conversion of the resin to an insoluble state and, from an insulation standpoint, can produce desirable properties in a few hours that weeks of air-drying might not achieve.

Baking not only removes moisture and solvents from the film or winding, but also greatly improves nearly all the electrical, mechanical, and chemical properties. There is also far less deterioration in service, because baking has produced chemical changes by making the varnish less susceptible to oxidation. This was true of the older oleo-resinous varnishes, but it is even more important with both straight and oil-modified synthetic types where heat promotes structural changes and curing that may never take place if the varnish is air-dried.

It is also very desirable to use higher baking temperatures with synthetic types to produce the best properties. A much better coil is obtained if it is baked at 125 C to 150 C than at 100 to 110 C, as the varnish sets so much faster with less oxidation.

The hardening process is complex in any case, and any insulating process must take into account the chemistry of the materials to make sure that the following are provided for: (a) complete penetration and filling; (b) complete removal of solvent; (c) polymerization of the varnish to a hard or gelatinous state where the best available properties are obtained; (d) removal of oxidation and polymerization reaction products before surface setting takes place; (e) retention of maximum varnish base in windings; (f) minimum injury to insulation already on the wire in the assembly, either from heat, solvents, or mechanical forces. At present, best results are obtained only by allowing proper time to accomplish these effects.

(Proper choice of viscosities of varnish, curing characteristics of the varnish base, need of oxygen, temperature-time relationships of heating of coils in a given oven, draft, ventilation, heat capacity, position of coils or assemblies, etc., all enter into the design of a satisfactory baking process. This is the most difficult part of the whole treating process to cope with.)

The chief methods of treatment of windings are: (a) dipping — with or without prebake; (b) vacuum filling; (c) pressure filling; (d) combinations of (b) and (c); (e) brushing or coating as coil is wound; (f) use of pretreated materials.

Dipping is the oldest and simplest method of applying varnish. In most applications, as on small motors, where baking temperatures from 125 to 150 C are used, prebaking is unnecessary,

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as all moisture in the insulation system is effectively removed during the baking cycle. In some instances, however, as in the treatment of coils of large cross section, it may be desirable to prebake the insulated coil or winding before dipping. This will facilitate varnish penetration.

Best results are obtained by using dipping varnish as heavy as possible, but which will still permit adequate penetration and filling. When the varnish is baked and the thinner evaporates, there will then be a sufficient amount of varnish base left to do a good job of insulating.

A varnish cannot be dried or hardened if allowed to stew in its own solvent vapors. In this connection, vacuum baking has proved most useful for complete drying of large coils; the process is not necessary for small motor windings.

### Wave Windings for A-C Motors

(*Continued from page 36*)

The sequence of conductor pick up for a four conductor per slot, left hand leads on bottom, counter clockwise winding is shown in Fig. 2 of the preceding chapter. (See June issue.)

The next chapter will continue the description and definition of a-c winding terms, and will define the series of coils, slots per pole per phase, and take up the construction of diagrams.

### Profitable Antenna Business Returns

(*Continued from page 22*)

installation of his service equipment and is doing a nice business on conventional and FM sets.

At the end of the war or just before, he expects to move into a new and larger building where he will handle the sale of FM sets, television sets, and a full line of electrical appliances such as ranges, refrigerators, and washing machines.

### Contractor's Opportunity In Electronic Field

(*Continued from page 26*)

tronics for the electrician, published by a nationally known concern.

It is my belief that the teaching of mathematics with such courses will discourage a great percentage of the men, and should be taught as a separate course to those who desire it. Mathematics has been found unnecessary in training men for this industry, as the engineering should be left to the contractor and factory representatives.

My staff sees the situation as it will be and is taking full advantage of this opportunity. I have been approached by others about attending our classes, but at the present, we have neither the time nor space available to train more than our own staff.

If contractors will look into the future and prepare for electronics, I see no reason why we cannot ask and get proper municipal control of the installation and maintenance of the greater percentage of electronic equipment.

### Home Wiring Is Good Specialty

(*Continued from page 21*)

in for wiring and the company charges $11 for the pair. They bore the hole in the base at the owner's risk, install the upright and the socket, and the customer furnishes the jug and the shade.

One of their customers recently located an antique kerosene chandelier,


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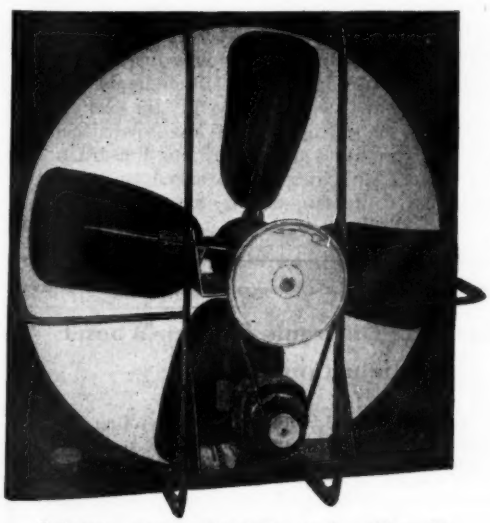

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one of the kind that was raised and lowered for filling and lighting by a brass chain. It was an ornate fixture with lots of glass prisms and other decorations. This lamp was electrified and hung. The whole thing cost the owner $350.

Bob Willis and Bob Craig own the C. & H. Electric Company and they expect to continue to specialize in household maintenance after the war.

"The demand will be even better," Mr. Craig said, "because there will be more appliances sold and plugged into the old wiring. Here in Kansas City they are now selling a room heater that pulls 1500 watts. Some home owners are buying them to warm up a cold corner and plugging them into a line which is already carrying an intermittent load of 2000 watts, so when fuses start popping or they smell rubber burning, they think of calling an electrician to have their wiring brought up-to-date."

---

## Limitations of Dielectric Heating

(*Continued from page 19*)

the engineering factors.

The voltage gradient, that is, the voltage per inch, permissible across the material may be a limiting factor. The radio frequency voltage which will puncture a given dielectric material is generally much lower than the 60 cycle voltage which a material will stand. It appears desirable to keep the voltage gradient below 2000 volts per inch in porous materials and less than 5000 volts per inch in less porous.

Another type of voltage limitation may be reached in some applications where it is impossible to have the electrodes in contact with the material. This gives rise to a condition in which the space between the electrodes is occupied by two materials of widely different dielectric constants. The potential distribution in this case may be such as to cause a breakdown of the surrounding medium (usually air).

This is a term commonly used to express the degree to which materials will absorb energy by dielectric heating technique. It is easily measured by means of proper equipment. As the loss factor approaches zero, it becomes increasingly difficult to transfer power into the material. A practical lower limit in the loss factor, of materials which can be heated effectively, appears to be between 0.005 and 0.01. Pure polystyrene, quartz and certain other loss materials have loss factors considerably below this value and are exceedingly difficult to heat by dielectric methods.

The upper limit probably blends into the range where the material becomes sufficiently conductive as to respond to inductive fields, although some skin effect will probably be noted before this limit is reached.

A whole treatise could be written on electrode design. One point to be emphasized is the fact that heat is not generated in the electrodes to any appreciable degree by the dielectric heating process. The electrodes may be heated by heat transfer from the dielectric material being processed. Often this is undesirable due to the temperature reduction of the adjacent material and may become a limiting factor in some processes. Various simple methods are in common use to minimize this effect.

Dielectric heating is a very useful tool in industry, one which is finding new applications every day. However, as with any tool, there are certain limitations which prevent its promiscuous application to all types of problems. By realizing these limitations, and the series of compromises often necessary, a careful analysis will permit the average electrical engineer to apply it intelligently to work which it can do well.

---

## Adequate Wiring For Virginia Schools

(*Continued from page 16*)

tion passed by the legislature will bring to all the schools of the state training programs which have been used so successfully by the army, navy and industrial plants during the war.

Intelligent use of motion pictures have produced unbelievable results in the field of learning and Governor Darden said the results were such "that there is no further reason to speculate."

There are 2,116 schools without electricity, 953 white schools and the balance negro schools.

Present classroom showings of film are expected to pass the 20,000 mark in the 450 schools able to use the equipment. In 1941 the classroom showings of film was only 3,723 but it jumped to 13,455 in 1943.

A scientific adequate lighting program will be laid out for the installation of electric lights in the unwired schools and officials of the Virginia Board of Education said that many young eyes would be saved.

There was no question but that many eyes were sacrificed because of squinting caused by lack of adequate lighting, particularly on the dark days of winter.

With talking moving pictures, adequate lighting and other modern improvements, many of the Virginia schools in more or less isolated communities and in locations at a distance from cities, are expected to become real community centers.


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While no definite instructions were issued in regard to letting wiring contracts and the purchase of equipment such as projectors, lighting fixtures, and other equipment, the state law provides for contracts to be let to the lowest and best bidder.

It is expected that the work will be spread among the contractors of the state so that many of the smaller operators will have a chance to participate in the work in their locality.

---

## How to Sell More Foot-Candles

(*Continued from page 12*)

than six fluorescent lamps, it is more expedient and economical to install continuous rows of units. This also makes for better distribution of light and often a better over-all appearance of the room.

If two continuous rows of units are installed in the room instead of the eight individual units, the foot-candles can be bumped up to 47 if four lamps per unit are used. Each row will require a total of nine units. Should a fixture be used having six lamps, the level of illumination can be raised further to 70 foot-candles. All of these foot-candle values are based upon a maintenance factor of .70 and after 100 hour's operation. The foot-candle measurements taken when lamps are new, therefore, will be considerably higher.

It must be remembered that a good lighting job does not mean high foot-candles alone. When 50 foot-candles or more are reached, the brightness may be excessive for comfortable seeing. The layman often refers to high brightness as "too much light." The error of such a statement is apparent when we consider that very comfortable seeing is experienced in the shade outdoors on a sunny day while the foot-candles measure 500 or more. Fifty or more foot-candles need not be "too much light" indoors if the brightness is controlled.

To reduce brightness, lamps should be concealed from view. Fixtures having bare lamps do not make for good seeing conditions. Louvers, translucent glass and plastic help to reduce the brightness and add to the favorable appearance of the room.

Fluorescent lighting provides an opportunity to relight America. It has caught the public fancy. It has reduced the cost of light materially. But there is nothing magical or different in the light from a fluorescent lamp than that from any other light source. It must be controlled as we must control daylight or the light from incandescent lamps in order to provide proper distribution and freedom from excessive brightness.

The same principles utilized in the years before the advent of fluorescent lighting will generally apply today. The care and good judgment used in planning new fluorescent installations will determine the pace of the progress we will make in the future. With our knowledge of the illumination requirements for good seeing and our experience in lighting fundamentals, we can bring America from darkness to light with profit and happiness to all.

---

## Refrigeration Firms Good Prospects

(*Continued from page 17*)

system at other points.

Condensation results when circulation of air is stopped, permitting moisture to collect in the system. Use of wrought iron conduit, lead cable and air tight light fixtures permits


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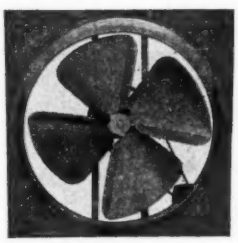
provides fully the comfort and ventilation so essential in army barracks, mess halls, hospitals, headquarters, theaters and other military buildings. Its fine design and sound construction meet the specifications drawn for army fans and it is particularly adaptable to the various types of installations found in army buildings.



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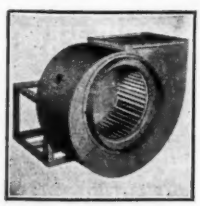

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free circulation of air, thus drying out what moisture collects and preventing troublesome condensation.

A properly installed moisture-proof system, according to Ludke, will render efficient service for from 15 to 25 years, provided it is not disturbed. He knows of one such installation that has been in service for 15 years on a Mississippi River boat.

In case of failures in a locker or refrigeration plant, temporary relief can be supplied by using RHT or Type RP wire, which is moisture resistant and complies with federal specifications. This installation will last from one to five years, depending on conditions, particularly the amount of condensation present. But the only permanent relief is obtained by the use of lead cable and vapor-proof fittings.

Such an installation, as sold by Ludke, costs the customer $15 per outlet, compared with the standard system at $8 per outlet. He would prefer to install basket weave leaded and armored cable, for that is the best material for the job, in his opinion, but it comes to $22.50 per outlet.

If the same size bulbs are used in vapor-proof fittings that were used in standard fixtures, there is a loss of about 10 per cent in the amount of light available. However, this deficiency can be overcome by using larger bulbs, and special shades are available for the creation of concentrated light areas.

Ludke points out that one advantage in going after this type of business is the fact that all such customers enjoy high priority ratings and there is no difficulty in obtaining necessary materials. His promises for completion of a job are made with reservations, however, because of the uncertainty of material delivery. But he can generally complete such an installation in 60 to 90 days.

Ludke says the field is not limited to locker and refrigeration plants. Approximately the same installation, being dust-tight, makes flour mills explosion proof. He has done such jobs for flour mills and thinks contractors in other regions should investigate these prospects.

Fertilizer plants are also on his prospect list, for the ammonia necessarily used eats out standard wiring in less than a year, he says.

This could be a tip to contractors looking for business, Ludke thinks, for ammonia is used in various industrial processes. Standard electrical installations also fail where there is a chemical action of sulphur and even coal cinders can destroy a standard wiring job, according to Ludke.

In addition to his contracting activities, Ludke has developed a substantial volume in re-winding and heavy motor repair and, even when his business was only 15 months old, he was already casting about for means of expanding his quarters.


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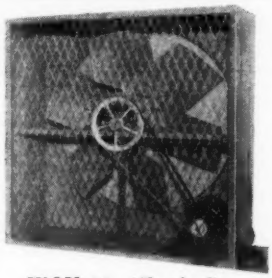

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